DOCUMENT RESUME

ED 431 760 SP 038 628

AUTHOR McTighe, Jay; Wiggins, Grant
TITLE The Understanding by Design Handbook.
INSTITUTION Association for Supervision and Curriculum Development, Alexandria, VA.
PUB DATE 1999-00-00
NOTE 281p.
AVAILABLE FROM Association for Supervision and Curriculum Development, 1703 Beauregard Street, Alexandria, VA 22311-1714; Tel: 703-578-9600; Tel: 800-933-2723 (Toll Free); Fax: 703-575-5400; E-mail: member@ascd.org (ASCD Stock No. 199030: members $26.95, nonmembers $31.95); Web site: http://www.ascd.org
PUB TYPE Guides - Non-Classroom (055)
EDRS PRICE EDRS Price MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Comprehension; *Curriculum Development; Elementary Secondary Education; Evaluation Methods; *Knowledge Level; Lesson Plans; Peer Evaluation; Planning; Student Evaluation

ABSTRACT

This handbook examines what understanding is and how it differs from knowing, discussing how teachers can know that students truly understand and can apply their knowledge in meaningful ways and how courses and units might be designed to emphasize understanding and uncoverage rather than coverage. The handbook includes a planning template, worksheets, exercises, design tools, design standards and tests, and a peer-review process for learning and applying new ideas. Handbook materials show users how to plan curriculum, assessment, and instruction. An overview of understanding includes the first three modules: (1) "Clarifying Understanding," (2) "The Backward Design Process," and (3) "The Understanding by Design Template." Stage 1, "Identify Desired Results," includes (4) "Identifying Enduring Understandings," (5) "From Topics and Skills to Understandings," and (6) "Framing Units around Essential Questions." Stage 2, "Determine Acceptable Evidence," includes (7) "Evidence of Understanding," (8) "Transforming Understandings into Performances," (9) "Designing Performance Tasks," (10) "Designing Scoring Rubrics," and (11) "Anchoring Unit Designs." Stage 3, "Plan Learning Experiences and Instruction," includes (12) "Engaging and Effective Design," (13) "Uncoverage," (14) "Misunderstanding," (15) "Where," (16) "Questions to Guide Teaching," (17) "Teaching Approaches," (18) "A Story Structure for Curriculum Design," and (19) "Curriculum as Task Analysis." A section entitled "Testing and Peer Review" includes (20) "Testing Designs Against Standards" and (21) "Peer Review." (SM)

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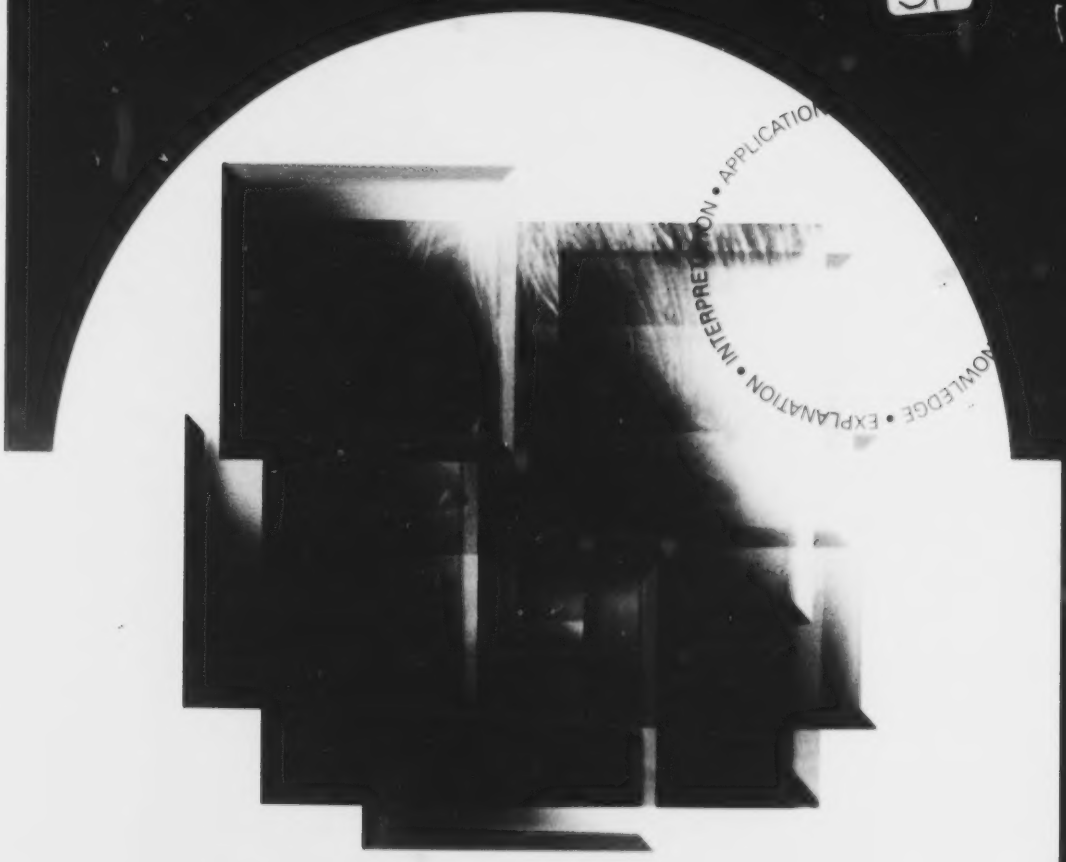

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The UNDERSTANDING *by* DESIGN *Handbook*

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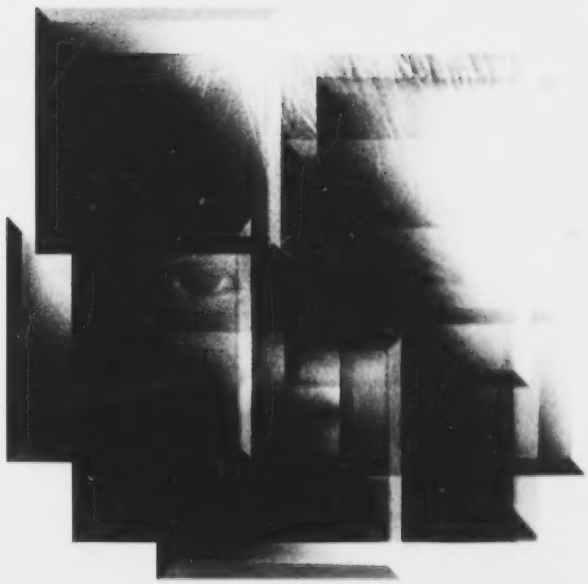

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Printed in the United States of America.
s7/99
ASCD Stock No. 199030 ASCD member price: $26.95 nonmember price: $31.95

The UNDERSTANDING *by* DESIGN *Handbook*

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Acknowledgments

Many individuals, far too numerous to mention, have helped us develop and refine the ideas and materials in this handbook over the last few years. First, we thank the hundreds of educators who gave us vital feedback and guidance as they worked with early versions of the template and worksheets. Jane Milley and the districts in the Cranberry Partnership were especially helpful in making these materials more practical and user friendly. We sincerely appreciate the reviews and recommendations provided by Bob Izzulino, Bob Jervis, H.B. Lantz, Joe Mills, Dan Nuzzi, Beverly Pish, and James Reidl. Discussions with these experienced and thoughtful educators helped sharpen our thinking and improve this handbook. We learned a great deal from studying other curriculum and assessment design materials and, in particular, acknowledge the fine work of the Project Zero group at Harvard University and the Maryland Assessment Consortium.

Special thanks are due to the members of the Understanding by Design cadre for their tireless efforts on behalf of this project: John Brown, Hilarie Davis, Lynn Erickson, Bill O'Rourke, Fran Prolman, Eleanor Renee Rodriguez, and Elliott Seif. Whether through their critiques of draft material, their assistance in workshops, or their recommendations of training ideas and support materials, this was a group that truly deserves the name "critical friends." In particular, we are indebted to

Lynn and Elliott, who gave countless hours of helpful criticism and advice. Their input has resulted in greater precision of language, clarity of examples, and attention to scaffolding to support educators in learning and applying the ideas of *Understanding by Design*. We gratefully acknowledge ASCD and the Pew Charitable Trusts for supporting the work of this talented development team.

Like the book, *Understanding by Design*, this handbook would never have come about without the material support and enthusiasm provided by Sally Chapman at ASCD. Sally did more than provide helpful feedback and direction for the design team—she was the first to have a vision of a comprehensive set of materials and services to support *Understanding by Design*, and the confidence in the authors to underwrite the various strands of the project. We are very grateful.

We are also thankful to Margaret Oosterman and Gary Bloom for their ability to fashion an unwieldy manuscript into a beautiful, well-edited, and well-designed final package. Margaret and her editorial colleagues deserve a special commendation for their patience and good-natured understanding in dealing with the unending changes and refinements that are the hallmarks of the authors. The manuscript is better for their talents and patience.

Finally, we once again thank our families for tolerating the endless phone calls, trips back and forth between Maryland and New Jersey, and the hours spent on the road using these materials. We trust that they again—understand.

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The UNDERSTANDING by DESIGN Handbook

OVERVIEW

Introduction

Understanding Understanding

Modules 1–3

BACKWARD DESIGN PROCESS

Stage 1:
Identify Desired Results

A ◗ Enduring Understandings

B ◗ Essential Questions

C ◗ Knowledge and Skills

Stage 2:
Determine Acceptable Evidence

D ◗ Performance Tasks

➤ Performance Task Blueprint (D)

E ◗ Quizzes, Tests, Prompts

F ◗ Unprompted Evidence

G ◗ Self-Assessment

➤ Blueprint for Other Evidence (E, F, G)

Stage 3:
Plan Learning Experiences and Instruction

H ◗ Sequence of Learning Experiences and Instruction

INTRODUCTION

Like two sides of a coin, *The Understanding by Design Handbook* is the natural companion to the book *Understanding by Design* (ASCD, 1998). *Understanding by Design* provides the conceptual foundation for a theory of understanding that is based on six facets of understanding. The book discusses the logic of a backward design approach to planning curriculum, assessment, and instruction; criteria for selecting matters of understanding; design standards for quality control; and misconceptions and misunderstandings. The handbook offers the practical side—a unit planning template, worksheets, exercises, design tools, design standards and tests, and a peer review process for learning and applying the ideas in *Understanding by Design*.

OVERVIEW

The handbook was developed to assist educators interested in designing units and courses of study that focus on developing and deepening students' understanding. It is also intended to serve as a resource for undergraduate- and graduate-level coursework and inservice professional development. We believe that various users, including teachers (elementary through graduate level), school-based administrators, curriculum directors, subject matter specialists, staff developers, and assessment-evaluation personnel, will find valuable ideas and resources within it.

Much of the explanatory text in the handbook comes from the book *Understanding by Design*. But a sharp-eyed reader of both the book and the handbook will notice differences. The handbook was written on the heels of numerous workshops. Feedback from workshop participants, as well as critique sessions with our colleagues, have led to refinements in how we label, explain, and analyze key ideas—for the better, we think. Our own work has been iterative, in other words, just as we say unit design work must be. We trust that these text revisions enhance the understanding and usefulness of the Understanding by Design theory.

Tabs

To offer maximum flexibility to users, we have divided the handbook into six sections, separated by tabs. Within the sections are 21 modules. The modules are grouped according to their use in the three stages of the backward design process. Here are the tab titles and a brief description of the materials in each section:

- **Overview.** The Overview contains the Introduction; the first and only chapter, entitled "Understanding Understanding"; and Modules 1–3. The "understanding" chapter explains the multifaceted nature of understanding and discusses the six facets of understanding, which provide the framework for the Understanding by Design approach. Modules 1–3 explain the backward design process and show readers the Understanding by Design template. The five-page template is the final product that designers complete to plan a unit. Users are not expected to understand how to fill it out until after they have worked through the handbook. The rest of the handbook explains how to complete the template, concentrating on specific elements of the template pages, and guiding readers through the three stages of the backward design process.
- **Stage 1** (Modules 4–6). The modules contain information to complete page 1 of the template.
- **Stage 2** (Modules 7–11). The modules contain information to complete pages 2–4 of the template.
- **Stage 3** (Modules 12–19). The modules contain information to complete page 5 of the template.
- **Testing and Peer Review** (Modules 20–21). Module 20 contains standards and accompanying tests for designers to use for self-assessment and peer review.

Module 21 contains information to conduct a peer review, using the standards and tests in Module 20.

■ **Glossary and Bibliography**. We tried to make the modules as self-contained as possible, but key terms recur throughout the handbook, and defining them each time they appear seemed cumbersome. So we put them in the Glossary for quick reference when clarification is needed. The Bibliography lists the references cited in the handbook plus other related publications.

Modules

Each module explains a particular idea about Understanding by Design. Module figures and worksheets use graphic organizers, design tools, and exercises to help clarify those ideas. Worksheets are designed to inductively guide learning and stimulate reflection about the big ideas in the Understanding by Design approach. Designers can use them to plan their own unit. Many worksheets have a corresponding figure; that is, a figure is a completed worksheet. For example, Figure 3.5 (Fig. 3.5) is a filled-out version of Worksheet 3.1 (WS 3.1). To try to anticipate reader misconceptions about ideas and their application, we have included "Misconception Alerts," which are set off within the module text.

A module concludes with a reflection from our mythical 5th grade teacher Bob James. James and his unit on nutrition were introduced in the book *Understanding by Design*. In the handbook, James attempts to apply the Understanding by Design ideas as he develops a three-week unit on nutrition.

ADVICE ABOUT USING THE HANDBOOK

Users of this handbook will likely face two questions: *Where should I begin?* and *In what order should I go?* We try here to explain why these understandable questions are difficult to answer, and how that fact has influenced the structure of the handbook.

As we note repeatedly throughout this book, curriculum design is an iterative, not a linear, step-by-step, standardized process. Successful designers find themselves constantly circling back to aspects of the design that need to be revised or rethought entirely in light of reflection, feedback from others, and experience with learners. But design work is more than iterative; it is idiosyncratic. The starting points, sequences, and tools will be as varied as the individual users in unique settings.

Building a unit design is more like painting from a blank canvas than painting by numbers, more like cooking from available ingredients than following cookbook recipes. As educational designers, we are like architects developing a blueprint. The architect cannot, in one fell swoop, listen to a client, review the building codes, research materials and labor costs, and develop a blueprint by following a step-by-step recipe. The blueprint emerges through a process of trying out ideas, getting feedback, matching the proposed ideas to the reality of the available space, and fulfilling client wishes. Each design idea affects other design ideas—and leads to a new, perhaps unexpected, reaction by the client, requiring more changes.

Architecture also has crucial givens, such as building codes, budget, and number of rooms and their functions. The challenge in design is to keep playing with the imaginative possibilities while ensuring that all the givens are honored. Curricular design has a similar challenge. The designer can imagine all sorts of wonderful possibilities, but a new idea about learning activities may require rethinking the proposed assessment plan. Givens exist here, as well—state content standards, realistic time and resource constraints, and student achievement levels and interest—and they must be balanced with our imagination.

Thus, this handbook cannot and does not provide a step-by-step procedure for building a unit. What we have done instead is to organize the handbook into modules that provide an overall logic (corresponding to the three stages of backward design) but permit beginning in many different places and following many different paths to achieve the same end—a completed design that meets standards.

Four common starting places in unit design illustrate both the difficulty of prescribing a sequence and the virtue of a modular handbook. Designs often begin with a state content standard; a favorite learning activity; a performance assessment task; or an event, idea, or text we want students to understand.

Clearly, each of these four starting points takes us through a different sequence. For example, when we begin with a content standard, we have to determine exactly what it means and what constitutes evidence of its attainment (Stage 2). Then we consider what learning activities and instruction would be appropriate for meeting the standard (Stage 3). On the other hand, when we begin with a performance task, we are likely to go somewhat in the opposite direction. We try to specifically and clearly determine what specific understandings such a task could assess (Stage 1), what state standards can be addressed by the unit, and what

changes to the task and scoring criteria can be made to make it a more valid measure. In both cases, our movement will be iterative: We will likely rethink and revise the desired understandings and appropriate assessments as we work through the whole design.

Though no specific recipe is therefore possible, we offer some general advice. As we said earlier, the handbook is organized to reflect the logic of backward design, and the sequence of the modules reflects the logic of the three stages and the order of the design template. The worksheets in each module are organized roughly by degree of difficulty, with the simpler design exercises first. Thus, though the modules have been written to be relatively independent of one another, they are arranged in a deliberate sequence. Designers will be best served by skimming the content of *all* the modules before beginning intensive design work. We also recommend that, regardless of the starting point, designers gravitate as soon as possible to answer the Stage 1 question of design purpose: Toward what important understandings, knowledge, and skill does it aim? Otherwise, designers run the risk of developing or refining activities and assessments that are inappropriate or invalid. The flip side of the advice is that we encourage designers to postpone the planning of specific learning activities (Stage 3), even though this area is often the most satisfying, until they have clarified the desired results and possible assessments in Stages 1 and 2.

■ ■ ■ ■ ■

We hope that the information in this book will stimulate individual reflection and promote thoughtful conversation among colleagues. We trust that the template, design tools, and tests will lead to improved designs—curriculums focused explicitly on key questions and big ideas worthy of understanding, more convincing evidence of understanding by students, and more engaging instruction and learning for students and teachers alike. Ultimately, observable and measurable improvements in learning and performance will result.

For up-to-date amplification of ideas provided in the handbook, readers are referred to the ASCD Web site on the Internet: http://ubd.ascd.org. This site includes an Understanding by Design home page containing updated information, frequently asked questions, information about an online database of units designed in the Understanding by Design format, and an Ask the Authors section.

UNDERSTANDING UNDERSTANDING

There are many different ways of understanding, overlapping but not reducible to one another and, correspondingly, many different ways of teaching to understand.
—PASSMORE, 1982, P. 210

We speak and write about understanding as if we fully understand it. But though we all claim as teachers to be after understanding, the irony is that we may not adequately understand our goal. This may seem like an odd statement. Teachers aim for understanding everyday, don't they? How can they not know what they are aiming for? Yet, there is plenty of evidence to suggest that "to understand" or "to teach for understanding" are ambiguous and slippery terms.

We see some of this conceptual uncertainty in the *Taxonomy of Educational Objectives: Classification of Educational Goals* (Bloom, 1956). Bloom and his colleagues wrote the book to classify and clarify the range of possible intellectual objectives, from the cognitively easy to the difficult. It was meant to classify degrees of understanding, in effect.

But in the introduction to the taxonomy, Bloom (1956) and others refer to understanding as a commonly sought but ill-defined objective:

> For example, some teachers believe their students should "really understand," others desire their students to "internalize knowledge," still others want their students to "grasp the core or essence." Do they all mean the same thing? Specifically, what does a student do who "really understands," which he does not do when he does not understand? Through reference to the taxonomy . . . teachers should be able to define such nebulous terms (p. 1).

Note from the authors: Much information in this chapter is from Wiggins & McTighe (1998). We provide it here to give readers the conceptual framework of Understanding by Design.

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At the heart of the confusion, we believe, is that understanding is different from knowledge. Of course, understanding depends upon subject knowledge, but understanding is more than knowledge, as familiar classroom scenes suggest. At one time or another we have all seen that a student can have a great deal of knowledge but limited understanding, such as what the knowledge means. We have also seen the opposite: A student may not have read the homework fully or carefully, but nonetheless has grasped the subtler points of an idea, seemingly lost on more dutiful students. Knowing the facts and doing well on tests of knowledge don't necessarily mean that students understand what they know, and doing poorly on tests of factual knowledge doesn't mean that students lack insight into the key ideas of a topic.

The same is true for accomplished men and women. In talking about Charles Darwin, researcher Frank Sulloway (1996) notes that what

> Differentiates revolutionary from nonrevolutionary thinkers is almost never a greater knowledge of the facts. . . . Darwin, who knew less, somehow understood more (p. 20).

GENUINE VERSUS APPARENT UNDERSTANDING

A key difference between knowledge and understanding based on knowledge is that the latter is always fluid, transferable to new contexts and transformable into new theory. Mere knowledge can be rote, more like correct beliefs than insight. Genuine performances of understanding, as Howard Gardner (1991), Harvard psychologist and educational researcher, puts it, occur when "students are able to take information and skills . . . and apply them flexibly and appropriately in a new and at least somewhat unanticipated situation" (p. 9). Such performances are opposed to "ritualistic" performances in which students "simply respond . . . by spewing back the particular facts, concepts, or problems sets that were taught" (p. 9).

Bloom (1956) and his colleagues remind us of this difference when they recount a famous John Dewey story:

> Almost everyone has had the experience of being unable to answer a question involving recall when the question is stated in one form, and then having little

> difficulty . . . when the question is stated in another form. This is well illustrated by John Dewey's story in which he asked a class, "What would you find if you dug a hole in the earth?" Getting no response, he repeated the question; again he obtained nothing but silence.
>
> The teacher chided Dr. Dewey, "You're asking the wrong question." Turning to the class, she asked, "What is the state of the center of the earth?"
>
> The class replied in unison, "igneous fusion" (p. 29).

Dewey's story also illustrates the rote nature of some knowledge learning. The emphasis on knowledge as involving little more than remembering or recall distinguishes it from conceptions of knowledge that involve understanding, insight, or that are phrased as "really know" or "true knowledge" (Bloom, 1956, p. 29).

The example is extreme, but the problem is universal. Teachers are often satisfied by signs of apparent understanding, such as students giving back the right words, definitions, or formulas. Change the question or terms, and students may reveal that they do not *really* understand what teachers thought they did.

This problem affects our most successful students, not just our low achievers. Exacerbating our problems as teachers and curriculum designers is the disturbing and well-documented phenomenon of student misconceptions about key ideas—misunderstandings that persist despite thorough teaching and apparent understanding as revealed on tests. (See Module 14: Misunderstanding.)

The problem of sorting out apparent from genuine understanding is made more pressing by a world of high-stakes testing and grading. For as long as education permits a cat-and-mouse game that gives students an incentive to *seem* to understand what they are supposed to learn, the challenge of teaching and assessing for understanding will be great.

If "correct" answers can offer inadequate or misleading evidence of understanding, or if good test results can hide misunderstanding, then what *is* genuine understanding? How does it manifest itself? How can design more effectively and reliably reveal it? Attempts to teach for understanding—by design as opposed to dumb luck—must answer these questions.

Understanding involves insights and the ability to use them effectively. But we know from common language use that understanding means different things. Sometimes people think of understanding as highly theoretical; at other times, they see it revealed in effective, practical real-world applications. Sometimes they think

of it as dispassionate critical analysis; at other times, as empathetic response. Sometimes it is seen as dependent upon direct experience; at other times, as gained through detached reflection. There seem to be different types of understanding, different methods of understanding, and overlap with other intellectual targets.

It makes sense, therefore, to identify different aspects of understanding, even if they overlap and ideally become integrated. We now turn to a more thorough and precise theory of understanding.

THE SIX FACETS OF UNDERSTANDING

We have developed a multifaceted view of what makes up a mature understanding, a six-sided view of the concept. The six facets are explanation, interpretation, application, perspective, empathy, and self-knowledge. They are most easily summarized by specifying the particular achievement each facet reflects. When one truly understands, one

- Can *explain*: provide thorough, supported, and justifiable accounts of phenomena, facts, and data.
- Can *interpret*: tell meaningful stories; offer apt translations; provide a revealing historical or personal dimension to ideas and events; make them personal or accessible through images, anecdotes, analogies, and models.
- Can *apply*: effectively use and adapt what one knows in diverse contexts.
- Have *perspective*: see points of view through critical eyes and ears, see the big picture.
- Can *empathize*: find value in what others might find odd, alien, or implausible; perceive sensitively on the basis of prior direct experience.
- Have *self-knowledge*: perceive the personal style, prejudices, projections, and habits of mind that both shape and impede one's own understanding. One is aware of what one does not understand, of why understanding is hard, and of how one comes to understand.

The facets reflect the different connotations of understanding, yet a complete and mature understanding ideally involves the more or less full development of all six kinds of understanding. The first three facets represent the kinds

of performances one with understanding can do; the latter three speak more to the types of insights one has.

These facets are different but related, in the same way that different criteria are used in judging the quality of a complex performance. For example, a "good essay" is composed of persuasive, organized, and clear prose. All three criteria need to be met, yet each is different from and somewhat independent of the other two. The writing might be clear, but unpersuasive; it might be well organized but unclear and somewhat persuasive. Similarly, a student may have a thorough and sophisticated explanation but not be able to apply it, or may see things from a critical distance but lack empathy.

Understanding is always a matter of degree, typically furthered by questions and lines of inquiry that arise from reflection, discussion, and use of ideas. For each facet, therefore, we

- Introduce the facet with a brief definition, followed by an apt quote and questions typical of someone wishing to better understand what the facet means.
- Offer examples of what the facet might look like in daily public life and in the classroom, as well as an example of what a lack of this type of understanding looks like.

MISCONCEPTION ALERT

We caution readers to treat these divisions as somewhat artificial and not the only possible take on the subject. The number six is not sacred, anymore than the five-paragraph essay is the only way to write discursively. The analytic framework we offer makes teaching and assessing for subject matter mastery more manageable. Another analysis might yield only three facets (e.g., application, explanation, and perspective) or five (as our initial theory had it). We have no doubt that further analysis might yield a different number of conceptual distinctions and hierarchies, and we, too, may make changes as we hear from readers and ponder further.

The number and names of the facets matter less than the differences in meaning of the term "understanding." The important point is that understanding should be seen as a family of related abilities. We trust that readers will see that "understanding by design" is made more likely through the kinds of distinctions we are making here.

■ Provide an analysis of the facet, offering a brief look at the instructional and assessment implications. (See *Understanding by Design* [Wiggins & McTighe, 1998] for a detailed discussion of these implications.)

Facet 1: Explanation

Definition: Sophisticated and apt explanations and theories, which provide knowledgeable and justified accounts of events, actions, and ideas.

> We see something moving, hear a sound unexpectedly, smell an unusual odor, and we ask: What is it? . . . When we have found out what it signifies, a squirrel running, two persons conversing, an explosion of gunpowder, we say that we understand.
>
> —Dewey, 1933, pp. 137, 146

Why is that so? What explains such events? What accounts for such an effect? How can we prove it? To what is this connected? How does this work? What is implied?

✔ A cook explains why adding a little mustard to oil and vinegar enables them to mix. The mustard acts as an emulsifier.

✔ A 10th grade history student provides a well-supported view of the causes of the American Revolution.

✖ A 10th grade student knows the facts of the Boston Tea Party and the Stamp Act but not why they happened and what they led to.

Facet 1 involves the kind of understanding that emerges from a well-developed and supported theory, an explanation that makes sense of puzzling or opaque phenomena, data, feelings, or ideas. It is understanding revealed through performances and products that clearly, thoroughly, and instructively explain *how* things work, *what* they imply, *where* they connect, and *why* they happened.

As Dewey (1933) put it, to understand something "is to see it in its *relations* to other things: to note how it operates or functions, what consequences follow from it, what causes it" (p. 137) (emphasis in original). A student reveals an understanding of things—an experience, a lesson by the teacher, a concept, or an individual performance—when the student can give good reasons and telling evidence to support the claims.

Knowledge of Why and How

Understanding is thus not mere knowledge of facts, but knowledge of why and how, laid out in evidence and reasoning. We know that the Civil War happened, and we can perhaps cite a full chronology. But why did the war happen? What was its impact? A student who can explain why steam, water, and ice, though superficially different, are the same chemical substance better understands the chemical formula H_2O than someone who cannot. To understand in this sense is to connect facts and ideas, including seemingly odd, counterintuitive, or contradictory ones, into a theory that works. More thorough or in-depth understandings involve more insightful and systematic explanations, where many diverse events or data are linked and subsumed under more powerful principles.

When we understand in this way, we can make inferences and offer predictions: We can go beyond the information given to make connections and associations. We understand guiding principles that explain and give value to the facts. Illuminating mental and physical models are one result of such understanding. We can bind together seemingly disparate facts into a coherent, comprehensive, and helpful account. We can predict unsought for or unexamined results, and we can illuminate strange or unexamined experiences.

Warranted Opinions

Explanatory understandings go beyond true opinions (mere right answers) to *warranted* opinions, a person's ability to explain his opinion so that he can justify how he got there and why it's right. Educators call upon learners to reveal their understanding by using such verbs as *explain, justify, generalize, support, verify, prove,* and *substantiate*. Regardless of the subject matter, or the age and sophistication of a student, when the student understands in the sense of Facet 1, she has the ability to "show her work," explain *why* the answer is right or wrong, give valid evidence and argument for a view, and defend that view against other views if needed. The student with the most in-depth understanding in this sense explains diverse data more precisely and grasps the subtler aspects of the ideas or experience in question.

Teachers invariably describe this type of understanding as thorough, nuanced, and in-depth (as opposed to merely glib or grandiose theorizing). An explanation or theory without such understanding is typically not so much wrong

as incomplete or naive. It is not wrong to say that the Civil War was fought over slavery, or that literature often involves good versus evil—just naive or simplistic.

Merely learning and giving back on tests the official theory of the textbook or teacher are not adequate evidence of understanding. Facet 1 calls for a student to be given assignments and assessments that require an explanation of varied and novel events before the teacher can conclude that the student understands what was taught.

Implications for Instruction and Assessment

Instructionally, this facet suggests that we deliberately seek a better balance between knowledge transmission (through a teacher and text) on the one hand and student theory building and testing on the other. A simple strategy is to make sure students have to ask the 5 "W" questions at the heart of journalism: who, what, where, when, and why.

Facet 1 calls for building units around questions, issues, and problems that demand student theories and explanations, such as those found in problem-based learning and effective hands-on and minds-on science programs. Other implications for assessment are straightforward—use assessments (e.g., performance tasks, projects, prompts, and tests) that ask students to explain, not simply recall; to link specific facts with larger ideas and justify the connections; to show their work, not just give an answer; and to support their conclusions.

Facet 2: Interpretation

Definition: Interpretations, narratives, and translations that provide meaning

> Juzo Itami's films revealed truths to the Japanese they never knew existed—even though they were right there in their daily life. "He could express the inside story about things people think they understand but really don't," said film critic Iun Ishiko.
>
> —*Washington Post*, 1997, p. A1

> The object of interpretation is understanding, not explanation. Understanding is the outcome of organizing essentially contestable, incompletely verifiable propositions in a disciplined way. One of our principal means for doing so is through narrative: by telling a story of what something is about. But as Kierkegaard had made clear

> many years before, telling stories in order to understand is no mere enrichment of the mind; without them we are, to use his phrase, reduced to fear and trembling.
>
> —Bruner, 1996, p. 90

What does it mean? Why does it matter? What of it? What does it illustrate or illuminate in human experience? How does it relate to me? What makes sense?

✔ A grandfather tells stories about the Depression to illustrate the importance of saving for a rainy day.

✔ An 11th grade student shows how *Gulliver's Travels* can be read as a satire on British intellectual life. The book is not just a fairy tale.

✖ A middle school student can translate all the words but does not grasp the meaning of a Spanish sentence.

We value engaging storytellers because a good story both enlightens and entertains. A clear and compelling narrative helps us find meaning, where before there may have been only scattered facts, cold and impersonal theory, and abstract ideas. Stories help us remember and make sense of our lives and the lives around us. The deepest, most transcendent meanings are found, of course, in the stories, parables, and myths that anchor all religions. A story is not a diversion; the best stories make our lives more understandable.

Meanings Transform Understandings

The meanings we ascribe to all events, big and small, transform our understanding and perception of particular facts. A student with such an understanding can show an event's significance, reveal an idea's importance, or provide an interpretation that strikes a deep chord of recognition and resonance. Consider how Martin Luther King Jr.'s memorable March on Washington speech ("I have a dream") and imagery crystallized the many complex ideas and feelings behind the Civil Rights movement. Or, think of how the best newspaper editorials make sense of complex political currents and ideas.

Meaning, of course, is in the eye of the beholder. Think of how much November 22, 1963 (the day President Kennedy was assassinated), means as a watershed event to those of us who came of age in the '60s, and how little that date means to today's

students. Or, consider the different readings of the same newspaper account of severe child abuse when the reader is a mother, a police officer, or an adolescent in a foster home. Social workers and psychologists might well have an accepted theory of child abuse in the sense of Facet 1. But the meaning of the event, hence an understanding of it, may have little to do with the theory, which is a scientific account with no bearing on the abused child's view of the event and the world.

Making sense of the stories of others involves translation and interpretation. Whether we think of a student struggling in German I, a 4th grader reading *Charlotte's Web*, or a scholar poring over the Dead Sea Scrolls, the challenge is the same: to understand words rooted in an author's intent but a puzzle to the reader who cannot see a clear meaning and significance. Similarly, experts in fields like history and archaeology must reconstruct the meaning of events and artifacts from the clues provided by the historical record. With this type of understanding, teachers ask learners to interpret, translate, make sense of, show the significance of, decode, and make a story meaningful.

Explanation and Interpretation

Explanation and interpretation are thus related but different. We may know the relevant facts and theoretical principles, but we can and still must ask, What does it all mean? What is its importance to me? To us? A jury trying to understand child abuse seeks significance and personal intent, not generalizations from theoretical science. A theorist builds objective and general knowledge about the phenomenon called abuse, but the story told by the lawyer, witness, or journalist may offer more insight.

As the example reveals, all acts of interpretation are more fraught with ambiguity than the act of theory building and testing. A text or a speaker's words may have different but valid meanings. As noted researcher, Jerome Bruner (1996) puts it: "Narratives and their interpretations traffic in meanings, and meanings are intransigently multiple" (p. 90). A theory needs to be true to work; a story need only illuminate, engage, and have verisimilitude. The same physical phenomenon cannot have three accurate explanations. But the same stories and events can have many different plausible and illuminating interpretations.

This narrative building (as well as the theory building of Facet 1) is the true meaning of constructivism. When we say that students must make their own

meaning, we mean that handing them prepackaged "interpretations," without their working through a problem and coming to see these explanations and interpretations as valid, is counterproductive—sham understanding. A purely didactic teaching of *the* interpretation is likely to lead to misunderstanding and forgotten knowledge, and ignores the arguable nature of interpretation, thus misleading students. The inherently problematic nature of certain ideas, texts, and experiences mandates an education that requires students, not just teachers and textbook writers, to develop interpretations and stories, an education that also ensures that student ideas get the feedback necessary to force continual testing and revision of those accounts.

Implications for Instruction and Assessment

The implications for instruction parallel those for the other facets. Educating students so that they will be able to think intelligently as adults requires that *they* learn to build stories and interpretations, not just passively take in official ones. They need to see how knowledge is built "from the inside." For example, a teacher might ask students to fashion an oral history from disparate interviews, a mathematical formula and graph from discrete properties, or an interpretation of a story from a careful reading. Learning cannot merely be the process of receiving what someone else says is the meaning of something, except as a way to model meaning making or as a prelude to testing an interpretation for better understanding the possibilities.

Facet 3: Application

Definition: The ability to use knowledge effectively in new situations and diverse contexts.

> [By understanding] I mean simply a sufficient grasp of concepts, principles, or skills so that one can bring them to bear on new problems and situations, deciding in which ways one's present competencies can suffice and in which ways one may require new skills or knowledge.
>
> —Gardner, 1991, p. 18

How and where can I use this knowledge, skill, or process? In what ways do people apply this understanding in the world beyond school? How should my thinking and action be modified to meet the demands of this particular situation?

✔ A young couple uses their knowledge of economics (e.g., the power of compounded interest and the high cost of credit cards) to develop an effective financial plan for saving and investing.

✔ 7th grade students use their knowledge of statistics to accurately project next year's costs and needs for the student-run candy and supply store.

✖ A physics professor can't diagnose and fix a broken lamp.

To understand is to be able to use knowledge. This is an old idea in U.S. education—indeed, an old idea in the long tradition of American pragmatism and cultural disdain for mere ivory-tower, academic thinking. We all say to young and old alike, "You need to walk the walk, not just talk the talk."

Matching Ideas to Context

Gardner's definition of genuine performance mentioned earlier echoes what Bloom (1956) and his colleagues said in the taxonomy. They saw application as central to understanding and quite different from the kind of plugging-in and fill-in-the-blanks pseudoapplication found in so many classrooms.

> Teachers frequently say: "If a student really comprehends something, he can apply it." . . . Application is different in two ways from knowledge and simple comprehension. The student is not prompted to give specific knowledge, nor is the problem old-hat (p. 120).

Application also needs to reflect real-world situations.

> Problems should be as close as possible to the situation in which a scholar/artist/engineer, etc., attacks a problem. The time allowed, conditions of work, etc., should be *as far from the typical controlled exam situation as possible* (Bloom, Madaus, & Hastings, 1981, p. 268) (emphasis in original).

Understanding involves matching one's idea or action to context. To show that we understand something we show our ability to use it, adapt it, customize it, not simply plug in knowledge in a formulaic manner. When we must negotiate different constraints, social contexts, purposes, and audiences, understanding is revealed as performance know-how, the ability to accomplish tasks successfully, with "grace under pressure" and with "tact for the concrete situation" (James, 1899/1958, p. 24).

Swiss child psychologist Jean Piaget (1973/1977) argued more radically that student understanding is revealed by a student's innovation when applying knowledge. He said that many so-called application problems, especially in mathematics, were not truly novel, hence, not indicative of true understanding:

> Real comprehension of a notion or a theory implies the reinvention of this theory by the student. Once the child is capable of repeating certain notions and using some applications of these in learning situations he often gives the impression of understanding; however, this does not fulfill the condition of reinvention. True understanding manifests itself by new spontaneous applications (pp. 726–732).

Implications for Instructions and Assessment

Thus, the instructional and assessment implications of Facet 3 call for an emphasis on performance-based learning—work that focuses on and culminates in more authentic tasks, supplemented by more conventional tests. (For more information, see Wiggins, 1998; McTighe, 1996–97.)

Facet 4: Perspective

Definition: Critical and insightful points of view

> The profit of education is the ability it gives to make distinctions that penetrate below the surface. . . . One knows that there is a difference between sound and sense, between what is emphatic and what is distinctive, between what is conspicuous and what is important.
>
> —Dewey, in Johnson, 1949, p. 104

> An important symptom of an emerging understanding is the capacity to represent a problem in a number of different ways and to approach its solution from varied vantage points; a single, rigid representation is unlikely to suffice.
>
> —Gardner, 1991, p. 13

From whose point of view? From which vantage point? What is assumed or tacit that needs to be made explicit and considered? What is justified or warranted? Is there adequate evidence? Is it reasonable? What are the strengths and weaknesses of the idea? Is it plausible? What are its limits? So what?

✔ A 10-year-old girl recognizes the fallacy in TV advertising of using popular figures to promote products.

✔ A student explains the Israeli and Palestinian arguments for and against new settlements on the Gaza Strip.

✖ A bright but rigid student refuses to consider that there is another way to look at gun control.

To understand in this sense is to see things from a dispassionate and disinterested perspective. This type of understanding does not involve a student's particular point of view, but instead is a mature recognition that *any* answer to a complex question typically involves a point of view. Therefore, an answer may be one of many possible plausible accounts. A student with perspective is alert to what is taken for granted, assumed, overlooked, or glossed over in an inquiry or theory.

Seeing from a Critical Distance

Perspective implies seeing from a distance, the ability to see the whole forest, not just the near trees. Different perspectives are often found by asking, What of it? and to see an answer—even a teacher or textbook answer—as a point of view. Perspective involves making tacit assumptions explicit, bringing to light and analyzing unexamined habits of thought and action. Students with perspective expose questionable and unexamined conclusions and implications.

Such perspective can lead to a powerful form of insight, because by shifting perspective and casting familiar ideas in a new light, one can create new theories, stories, and applications. When a student can take different perspectives, she gains a critical distance from the habitual or knee-jerk beliefs, feelings, theories, and appeals that less careful and less circumspect thinkers fall prey to. Then she can shift her point of view, try out new ways of seeing, and discover new theories and interpretations.

A definition of the verb *understand* in the *Oxford English Dictionary* is "to know the import of" something. By this criterion, the U.S. educational system is not very successful in causing understanding. Few students leave school with an understanding of the value of their schoolwork—and of the value of the discipline required to learn the disciplines. Few can successfully ask and answer, What of it? Such an attitude is central to what is meant by a liberal education.

Perspective involves the discipline of asking, Why might this matter? How might its value be clearer from another point of view? How, for example, would my

critics see things? In his autobiography, Darwin (1958) noted that this critical stance was key to his success in defending his controversial theory:

> I . . . followed a golden rule that whenever a published fact, a new observation or thought came across me, which was opposed to my general results, to make a memorandum of it without fail and at once; for I had found by experience that such facts and thoughts were far more apt to escape from memory than favorable ones. Owing to this habit, very few objections were raised against my views that I had not at least noticed and attempted to answer (p. 123).

Perspective as an aspect of understanding is a mature achievement, an escape from our egocentric beliefs in systematizing different vantage points. Novice learners, just setting out on the road to mastery, may have a revealing point of view, even when they lack a thorough explanation of things. Consider the child in *The Emperor's New Clothes*. But novices lack the ability to take *multiple* perspectives.

A student with a sophisticated perspective can simultaneously value teacher and textbook accounts while recognizing them as representing points of view. What is the point of view of the authors of a U.S. history or a physics textbook about what is true, verified, and important? Do other authors share those views? Do different experts, teachers, and authors establish different priorities? If so, what is their justification? What advantages or disadvantages do other points of view have? That this line of questioning seems too esoteric or odd shows how far education is from giving students needed perspective. Everyone recognizes the problem of maintaining perspective in newspaper reporting, so why isn't it addressed in textbook writing? Everyone knows that authors' views shape choice of content, emphasis, and style, so why aren't students helped to use these language arts skills in understanding textbooks and the theories in them?

Implications for Instruction and Assessment

Facet 4 suggests that instruction include explicit opportunities for students to confront alternative theories and diverse points of view about big ideas. An essential perspective on perspective involves encouraging students and designing coursework to ask and answer these questions: What of it? What does it mean? What follows? These questions need to be asked for all core knowledge and texts in the students' experience. One might say that these questions and attempts to

answer them are the perspective of any liberally educated person. Instructional and assessment strategies need to better highlight the means and ends of a liberal education, namely greater control over essential questions and ideas so that students can see both intrinsic and extrinsic value in intellectual life.

Facet 5: Empathy

Definition: The ability to get inside another person's feelings and worldview.

> To understand is to forgive.
>
> —old French proverb

> "Do women ever come up to you and say, 'How did you know that? How did you feel that?' " I ask, and for the first time, he turns and looks at me evenly.
>
> "Yeah, that's the normal response," he says in a voice that suddenly isn't so shy. "It's not that I understand women any better than anyone else, but I do understand feelings. . . . All you have to do is imagine what that girl is going through, just turn it around and put yourself in those same shoes. . . . We're all the same people."
>
> —The singer Babyface
>
> *New York Times Sunday Magazine*, 1997, Sec. 6, p. 22

How does it seem to you? What do they see that I don't? What do I need to experience if I am to understand? What was the artist or performer feeling, seeing, and trying to make me feel and see?

✔ An Israeli adolescent empathizes with the restrictive and constrained life of his Palestinian contemporaries.

✔ From a recent British national exam: "*Romeo and Juliet*, act 4. Imagine you are Juliet. Write your thoughts and feelings explaining why you have to take this desperate action."

✖ An accomplished basketball player-turned-coach often berates his young players because he cannot relate to their struggles in learning the game.

Empathy, the ability to walk in another's shoes, to escape one's own emotional reactions to grasp another's, is central to the most common colloquial use of the term *understanding*. When we try to understand another person, people, or culture, we strive for empathy. It is not simply an affective response or sympathy.

Empathy is a *learned* ability to grasp the world from someone else's point of view. It is the discipline of using one's imagination to see and feel as others see and feel. It is different from perspective, which is to see from a critical distance, detaching one's self to see more objectively. With empathy, one sees from inside the person's worldview, embracing the insights that can be found in the subjective or aesthetic realm.

A German scholar, Theodor Lipps, coined the term *empathy* at the turn of the 20th century to describe what the audience must do to understand a work or performance of art. Empathy is the deliberate act of finding what is plausible, sensible, or meaningful in the ideas and actions of others, even if those actions are puzzling or off-putting. Empathy can lead us not only to rethink a situation but also to have a change of heart as we come to understand what originally seemed odd or alien.

This kind of understanding implies an existential or experiential prerequisite. If, when referring to such experiences as poverty, abuse, racism, or high-profile competitive sports, someone says, "You cannot possibly understand without having been there," the implication is that insight from experience is necessary for understanding. A recent controversy involving the songwriter Paul Simon echoed the same theme (*USA Today*, 1997). Some Puerto Ricans contended that a Jewish man cannot possibly understand the experience of Puerto Ricans. The subject was a new musical, "Capeman," cowritten and produced by Simon and Reuben Blades. Though we might disagree with that particular sentiment, we regularly acknowledge as teachers that students need to directly or indirectly experience the ideas they study, or their understanding will be hobbled.

Empathy as a Form of Insight

Empathy, too, is a form of insight because it involves the ability to get beyond odd, alien, or seemingly weird opinions or people to find what is meaningful in them. Students have to learn how to open-mindedly embrace ideas, experiences, and texts that might seem strange, off-putting, or difficult to access, in order to understand them and their connection to what is more familiar. They need to see how weird or dumb ideas can seem insightful or sophisticated once they can overcome habitual responses, and they need to see how habit blocks their understanding of another person's understanding.

Empathy is linked to self-knowledge (Facet 6) because we must bracket our prejudices to empathize:

> The hermeneutical attitude supposes only that we self-consciously designate our opinions and prejudices and qualify them as such. . . . In keeping to this attitude, we grant the text the opportunity to appear as an authentically different being and to manifest its own truth, over and against our preconceived notions (Gadamer, 1994, pp. 238–239).

All great interpreters and historians of ideas need empathy. "If we laugh with derision" at the theories of our predecessors, as anthropologist Stephen Jay Gould (1980) says, we will fail "in our understanding of their world" (p. 149). From his own experience to find new meaning in what had seemed inadequate views about motion in Aristotle's work, Kuhn (1977) suggests:

> When reading the works of an important thinker, look first for the apparent absurdities in the text and ask yourself how a sensible person could have written them. When you find an answer, when those passages make sense, then you may find that more central passages, ones you previously thought you understood, have changed their meaning (p. xi).

An example of the need for empathy can be found in the U.S. system of government. Few students know that for more than 100 years, U.S. senators were appointed, not popularly elected. Fewer still understand why such a practice seemed like a good idea then. It is easy to imagine that our forefathers were misguided or hypocrites. Today's teachers could use assignments and assessments that ask students to role-play as the writers of the Constitution. The challenge would be to make a case to a group of citizens that appointed offices are in the citizens' best interest. A postscript could be to ask for an essay or journal entry on the pros and cons of the current popular vote approach, and a further consideration of the value, if any, of the electoral college.

Need for a Change of Heart

As noted in an earlier discussion of language, understanding in the interpersonal sense suggests not merely an intellectual change of mind but also a significant change of heart. Empathy requires respect for people different from ourselves

and openness to what they have to say. Respect for others causes us to more willingly and carefully consider others' views when they are different from ours.

It becomes easier, then, to imagine schoolwork that deliberately confronts students with strange or alien texts, experiences, or ideas to see if they can get beyond what is off-putting about the work. Such activity, in fact, is common in foreign language classes that stress cultural issues. It is the point of using many fables and such stories as Shirley Jackson's *The Lottery* and Camus' *The Stranger*. It is key to learning history, a point made by the Bradley Commission on the Teaching of History, which argues that a primary aim of history is to help students escape their ethnocentric and present-centered views (Gagnon, 1989).

Implications for Instruction and Assessment

To ensure greater understanding of abstract ideas, students must have far more direct or simulated experiences of them than most current textbook-driven courses now allow. We refer in *Understanding by Design* to the idea of an "intellectual Outward Bound" to capture the needed changes: Learning needs to be more experiential, more geared toward making students directly confront the effects—and *affect*—of decisions, ideas, theories, and problems. Put differently, the absence of such experience may explain why so many important ideas are misunderstood and learnings so fragile, as the literature on misconception reveals. Assessment must also pay greater attention to whether students have overcome egocentrism, ethnocentrism, and present-centeredness in their answers and explanations.

Facet 6: Self-Knowledge

Definition: The wisdom to know one's ignorance and how one's patterns of thought and action inform as well as prejudice understanding.

> All understanding is ultimately self-understanding. . . . [A] person who understands, understands himself. . . . Understanding begins when something addresses us. This requires . . . the fundamental suspension of our own prejudices.
>
> —Gadamer, 1994, p. 266

> It is the duty of the human understanding to understand that there are things which it cannot understand, and what those things are.
>
> —Kierkegaard, 1959, No. 1395, 1854 entry

How does who I am shape my views? What are the limits of my understanding? What are my blind spots? What am I prone to misunderstand because of prejudice, habit, or style?

✔ A mother realizes that her frustration with her daughter's shyness is rooted in issues from her own childhood.

✔ Mindful of the fact that many students are visual learners, a middle school teacher includes visual organizers and images.

✖ When all you have is a hammer, every problem looks like a nail.

Deep understanding is ultimately related to what is meant by wisdom. To understand the world, we must all understand ourselves. Through self-knowledge, we understand that what we understand is often intertwined with what we believe and expect to see, that sometimes what we think we understand is "out there" is actually a mental habit projected onto reality.

With maturity, we come to understand that we do *not* understand. "Know thyself" is the maxim of those who would *really* understand, as the Greek philosophers often said. Socrates is the patron saint of understanding; he *knew* he was ignorant and needed to continually reflect and question beliefs.

In daily life, the capacity to accurately self-assess and self-regulate reflects such understanding or its absence. Metacognition, or self-knowledge about how we think, why we think it, and the relation between our preferred methods of learning and our understanding (or lack of it), are involved. An immature mind is not merely ignorant or unskilled but *unreflective*. A naive student, no matter how bright and learned, is lacking in self-knowledge to know when an idea seems objectively true but really only fits the student's beliefs, or to know how styles or perceptual frames shape how and what is understood. The challenge for self-knowledge is to learn when prejudice, not insight, determines our understanding.

Stephen Jay Gould (1996), Harvard paleontologist and popular writer on science, has eloquently warned about the danger of confusing insight with prejudice:

> Our prejudices often overwhelm our limited information. . . . Nature is objective, but we can only view her through a glass darkly—and many clouds upon our vision are of our own making: social and cultural biases, psychological preferences, and mental limitations (p. 8).

This caution is an old one, going back to Francis Bacon's writing 300 years ago on the "idols" (illusions) that impede the progress of science:

> The human understanding is of its own nature prone to suppose the existence of more order and regularity in the world than it finds. . . . [and] when it has once adopted an opinion draws all things else to support and agree with it. . . . It is the peculiar and perpetual error of the intellect to be more moved and excited by affirmatives than by negatives. . . . Numberless, in short, are the ways, and sometimes imperceptible, in which the affections color and infect the understanding (Aphorisms 46 and 49, pp. 50 and 52).

What Self-Knowledge Demands

Self-knowledge is a key facet of understanding because it demands that we all self-consciously question our understandings to advance them. It asks us to have the discipline to seek and find the *inevitable* blind spots, prejudices, or oversights in our thinking and to have the courage to face the problems lurking underneath effective habits, naive confidence, strong beliefs, and worldviews. When we talk of subject matter disciplines, such courage and persistence are the essential sources of rational understanding as opposed to dogmatic belief.

Implications for Instruction and Assessment

Practically speaking, a greater attention to self-knowledge means that as teachers we must do a better job of teaching and assessing self-reflection. In one area, we do that quite well. Many programs and strategies exist to help students develop greater metacognition and awareness of their own preferred learning style. But the ideas expressed in this book suggest that greater attention is needed to self-assess the philosophical abilities that fall under the heading "epistemology"—the branch of philosophy that addresses what it means to know and understand, and how knowledge differs from belief and opinion.

For a more thorough account of the facets, readers are encouraged to review Chapter 3 of *Understanding by Design* (Wiggins & McTighe, 1998) or the video *Understanding by Design: What Is Understanding?* (Kiernan, 1998).

MISCONCEPTION ALERT

We have already noted that any robust teaching of understanding must grapple with the phenomenon of misunderstanding. And throughout the book, we alert readers to potential misunderstandings of various points. Now we direct that concern to the facets themselves. The following list of misconceptions is not intended to be exhaustive, merely suggestive and cautionary.

Facet 1: Explanation

Misconception 1: If a student gives a correct answer to a complex and demanding question, the student must have an in-depth understanding.

Misconception 2: If a student cannot write an explanation of her views, then she lacks understanding.

Both these misconceptions involve the plausible but incorrect view that a student who can provide an accurate answer and explanation on a test understands that answer. But we have all seen students who could correctly give back what they learned, without understanding why the answer or explanation is correct. This concern is one reason that at the doctoral level a dissertation and its defense are required. Right answers, with documentation, could be merely borrowed and not understood.

The second misconception is the reverse view, a common problem in assessment: A performance test is an invalid way to assess knowledge when the performance ability (or lack of it, in this case) determines the quality of the answer. For example, a student writes a beautiful and flowing essay but has little of substance or novelty to say; another student is a poor writer but the essay is filled with insights. Often in such assessments, the writing quality outweighs the understanding being assessed—improperly—if the aim is to assess understanding and not writing ability.

Facet 2: Interpretation

Misconception: If a student offers an engaged and rich response to literature, the student understands that piece of literature.

This is a common misconception in language arts. Reader response becomes equated or confused with understanding the text. For example, a student's fluent response to a text is sometimes described in terms that suggest the success is equivalent to a substantiated and subtle interpretation of the text. But some highly responsive and engaged readers get the meaning wrong, and some seemingly detached or bored readers can penetrate to the core of a book's most important ideas and meanings.

Facet 3: Application

Misconception 1: Any effective performance showing knowledge indicates understanding of that knowledge.

Misconception 2: Any ineffective performance showing knowledge indicates a lack of understanding of that knowledge.

These misconceptions are common in activity-based teaching and performance-based assessment. It is easy to assume that if a student performs well, then he understands; that if he has learned the skills of persuasive writing or soccer, then he must understand what to do. But the two are not synonymous. As educators, we can make assessment clearer by asking such questions as, Does the student understand persuasion? and, Does the student understand the purpose of the game and apply deliberate strategies? In other words, Is there a purposefulness and reflectiveness to performance?

Persuasion and the strategies of the game can and must be taught, learned, and assessed using additional performances from the targeted skills. This work suggests that in addition to actual performance applications (Facet 3), students would be asked to explain *what* they did and *why* (Facet 1).

The reverse is true. Students who do poorly on a specific performance task do not necessarily misunderstand the topic. As with explanation, they may be unskilled at the performance but understand it. Consider, for example, sports commentators who cannot play a sport but can reveal through analysis their deep understanding of a game. Educators must be wary of making invalid inferences on the basis of performance results. To put the matter more precisely, they need to make sure that they have built in the most appropriate performances of understanding.

Misconception 3: Application means that a student can correctly answer teacher-assigned problems based on what was taught.

This is a long-standing misconception abetted by textbook end-of-chapter problems and standardized tests. Authentic application involves novel problems, realistically messy situations, and adaptations and adjustments to theoretical knowledge and skill. Algorithmic or mechanical application is rarely adequate in authentic contexts that require judgment, heuristics, problem solving, and adjustment based on feedback.

Facet 4: Perspective

Misconception 1: Having an opinion equals having perspective.

Misconception 2: Perspective implies relativism.

Both views represent an ancient misunderstanding that many thinkers have tried to expose and eradicate. Just because one finds a view plausible or well argued

➤ **MISCONCEPTION ALERT** *(continued)*

MISCONCEPTION ALERT

(continued)

does not mean that it is correct. Just because one can find criticisms in all complex theories and arguments does not mean that all theories are equal. On the contrary, criticism is the only way to get beyond relativism. Such perspective is, of course, threatening to those who prosper and retain authority based on an orthodoxy.

Facet 5: Empathy

Misconception 1: Empathy is affect, synonymous with sympathy or heartfelt rapport.

Misconception 2: Empathy requires agreement with the point of view in question.

Empathy is not sympathy. It is a disciplined effort to understand what is different, not a question of feeling what other people feel. Similarly, just because one works to understand what is different doesn't mean one agrees with it. Rather, one comes to understand it as plausible.

Facet 6: Self-Knowledge

Misconception 1: Self-knowledge equals self-centeredness.

Self-knowledge is the opposite of self-centeredness. When we know ourselves, we know the limits of ourselves and are far less likely to confuse our views with those of others or our knowledge with our prejudices.

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MODULE 1

CLARIFYING UNDERSTANDING

We all claim as teachers to be after understanding. But, ironically, we may not understand understanding. This may seem like an odd statement. Teachers aim for understanding every day, don't they? How can they not know what they are aiming for? Yet, there is plenty of evidence to suggest that "to understand" or "teach for understanding" are ambiguous and slippery terms.

USING THE MODULE

The worksheets in Module 1 are designed to help educators clarify their thinking about understanding. We suggest completing each worksheet individually and then discussing it with colleagues in pairs or small groups. After the pair or group discussions, share your examples, generalizations, and insights with the larger group.

Worksheet 1.1 introduces the multifaceted nature of understanding. Typically, people identify several if not all of the six facets. The exercise provides a natural lead-in to an overview of the six facets, which are summarized in Figure 1.1. Worksheet 1.2 explores the relationship among knowledge, skill, and understanding. Although the worksheet has no correct answers, users generally recognize that knowledge, skill, and understanding are interrelated but not identical. Figure 1.2 shows two graphic representations.

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MISCONCEPTION ALERT

- The words *know* and *understand* are not synonyms. A student can have an accurate and thorough knowledge of something without understanding why the knowledge is justified, what the knowledge means, or what can be done with that knowledge.

- A common misunderstanding is that one either gets it, or one doesn't, and when one gets it, there is a mental "aha!" Such a response confuses results with psychological states. A student may not understand a complex idea but think he does because of an immediate "aha!" Or, a student may think she understands something after considerable effort or struggle—also an "aha!" moment. The degree to which one understands is revealed through performance, not whether or not one has a certain inner feeling.

REFLECTION FROM BOB JAMES

I guess I have always used the words *know* and *understand* interchangeably. But now that I think about it, there have often been times when kids were able to correctly answer the knowledge-recall questions on my tests, and yet I knew they didn't really understand the material.

I also see that having lots of knowledge doesn't mean you can use what you know. I recall last year when two of my better students, who aced all my quizzes and tests in the nutrition unit, could not analyze their family's menu planning and shopping to come up with a more nutritious plan. I also noticed that they ate mostly junk food at lunch. So, I guess *know*, *know-how*, and *understanding* are different.

WORKSHEET 1.1

CLARIFYING UNDERSTANDING

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

What do people mean by *understand?* Consider the various meanings in these statements:

- Men just don't understand women!
- He knows the historical facts but doesn't understand what they mean.
- I can understand the Palestinian point of view.
- I didn't really understand it until I had to use it.
- Does anyone here understand French?
- I understood exactly what she needed to hear at that moment.
- She knows the answer but doesn't understand why it is correct.
- Grandfather's stories about the Depression helped us understand the importance of saving.
- I understand what you're feeling.

In the box, list various connotations of *understand.*

Someone who understands . . .

-
-
-
-
-
-

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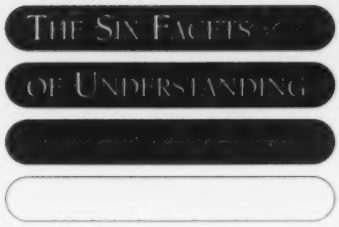
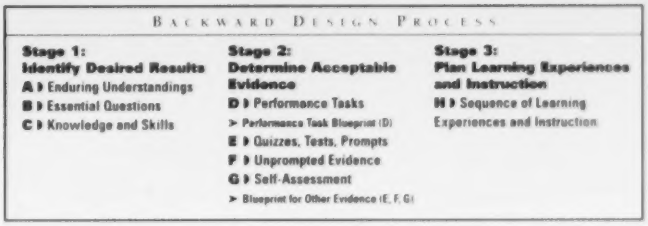
FIGURE 1.1





Facet 1: Explanation
Sophisticated and apt explanations and theories, which provide knowledgeable and justified accounts of events, actions, and ideas.

Facet 2: Interpretation
Interpretations, narratives, and translations that provide meaning.

Facet 3: Application
The ability to use knowledge effectively in new situations and diverse contexts.

Facet 4: Perspective
Critical and insightful points of view.

Facet 5: Empathy
The ability to identify with another person's feelings and worldview.

Facet 6: Self-Knowledge
The wisdom to know one's ignorance and how one's patterns of thought and action inform as well as prejudice understanding.

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WORKSHEET 1.2

Relationship Among Knowledge, Skill, and Understanding

Backward Design Process

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

What is the relationship among knowledge, skill, and understanding? In the space below, make a graphic representation to show how the three are related (or not related).

Given your graphic representation, list in the box what is suggested for methods of instruction, kinds of assignments and activities, sequence of work, and types of assessments.

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FIGURE 1.2

RELATIONSHIP AMONG KNOWLEDGE, SKILL, AND UNDERSTANDING

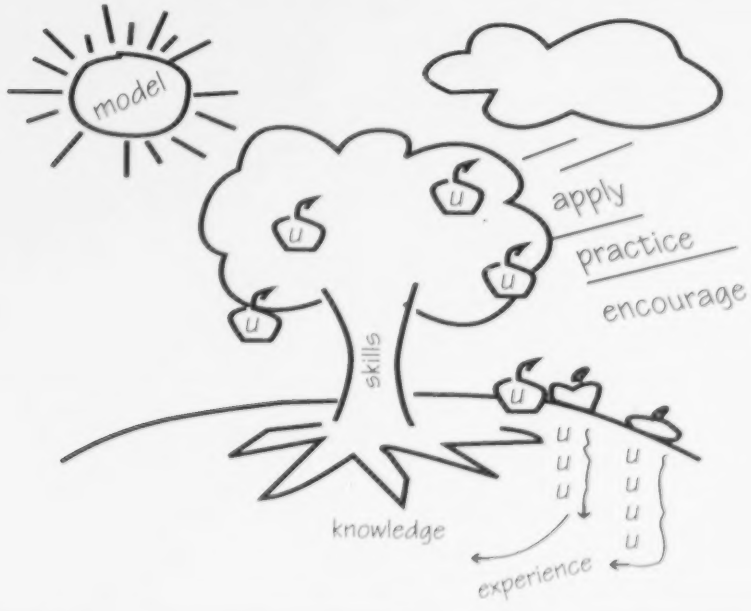
Graphic Representations

BACKWARD DESIGN PROCESS

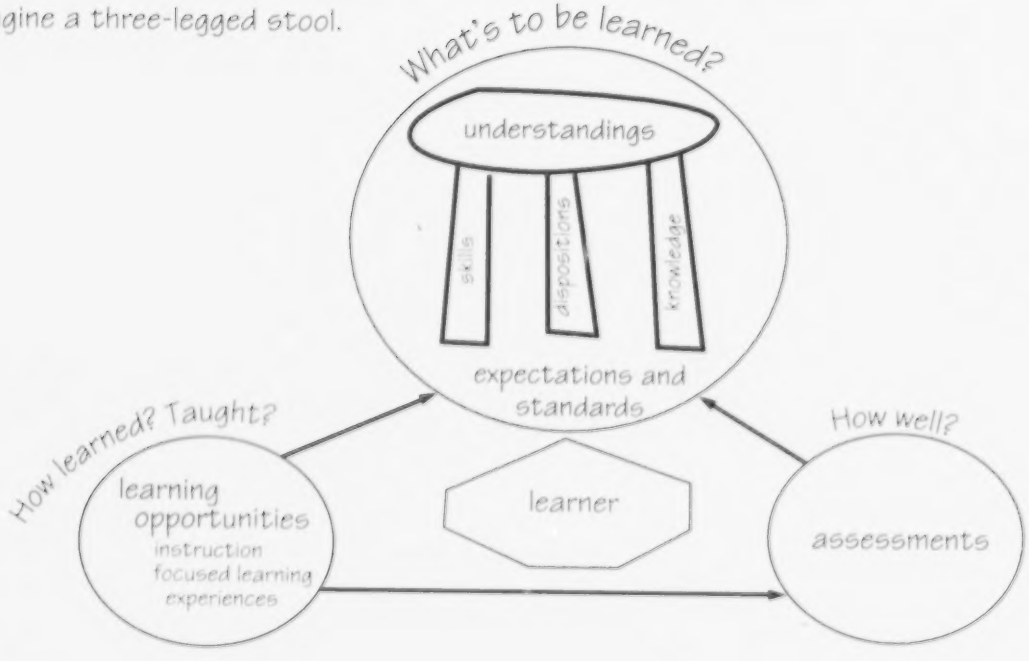
Stage 1: Identify Desired Results
- **A ▸** Enduring Understandings
- **B ▸** Essential Questions
- **C ▸** Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D ▸** Performance Tasks
  - ➢ Performance Task Blueprint (D)
- **E ▸** Quizzes, Tests, Prompts
- **F ▸** Unprompted Evidence
- **G ▸** Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H ▸** Sequence of Learning Experiences and Instruction



Imagine a three-legged stool.



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MODULE 2

THE BACKWARD DESIGN PROCESS

Teachers are designers. An essential act of our profession is the design of curriculum and learning experiences to meet specified purposes.
—WIGGINS & MCTIGHE, 1998, P. 7

USING THE MODULE

Curriculum is a means to an end. Our approach, Understanding by Design, focuses on a particular topic (e.g., racial prejudice), uses a particular resource (e.g., *To Kill a Mockingbird*), and chooses specific instructional methods (e.g., Socratic seminar to discuss the book and cooperative groups to analyze stereotypical images in films and on TV) to cause learning to meet a given standard (e.g., "The student will understand the nature of prejudice, and the difference between generalizations and stereotypes").

We believe that the most effective curricular designs are backward. Backward design may be thought of as purposeful task analysis: Given a task to be accomplished, how does one get there? Or one might call it planned coaching. What kinds of lessons and practices are needed to master key performances? The approach to curricular design we recommend is logically forward and commonsensical, but backward by conventional habits, whereby many teachers typically *begin* with textbooks, favored lessons, and time-honored activities rather than deriving them from targeted goals or standards. We are advocating the reverse: One starts with the end—the desired results (goals or standards)—and then derives the curriculum based on the evidence of learning (obtained through assessments) called for by the goals and standards.

This backward approach to curricular design departs from another common practice: thinking about assessment as something teachers do at the end, once teaching is completed. Rather than creating assessments near the conclusion of a unit of study—or relying on the tests provided by textbook publishers, which may not completely or appropriately assess relevant standards—backward design calls for teachers to operationalize their goals or standards in terms of assessment evidence as they begin to plan a unit or course. Such a process reminds them to begin with a question—What evidence would I accept that students have attained the desired understandings and proficiencies?—*before* proceeding to plan teaching and learning experiences. Many teachers who have adopted this design approach report that the process of "thinking like an assessor" about evidence of learning not only helps them to clarify their goals, but also results in a more sharply defined teaching and learning target so that students perform better knowing *their* goal. Greater coherence among desired results, key performances, and teaching and learning experiences leads to better student performance—the purpose of design.

The backward design process consists of three general stages, shown in Figure 2.1.

FIGURE 2.1 STAGES IN THE BACKWARD DESIGN PROCESS

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Stage 1. Identify Desired Results

In this first stage, we consider our goals, examine established content standards (national, state, and district), and review curriculum expectations. Because there is typically more content than can reasonably be addressed in the available instructional time, we are obliged to make choices. What should students know, understand, and be able to do? What is worthy of understanding? What "enduring" understandings are desired? Understandings of this type are important ideas or core processes that are transferrable to new situations.

Stage 2. Determine Acceptable Evidence

How will we know if students have achieved the desired results and met the standards? What will we accept as evidence of student understanding and proficiency? In the second stage, the backward design orientation suggests that we think about a unit or course in terms of the collected assessment evidence needed to document and validate that the desired learning has been achieved—so that the course is not simply content to be covered or a series of learning activities. This approach encourages teachers and curriculum planners to first think like an assessor before designing specific units and lessons, and thus to consider up front how they will determine if students have attained the desired understandings.

When planning to collect evidence of understanding, a teacher should consider a range of assessment methods. Given the focus on understanding, performance tasks should anchor a unit or course because they provide evidence that students are able to use their knowledge in context, a more appropriate means of evoking and assessing enduring understanding. More traditional assessments, such as quizzes, tests, and prompts, are used to round out the picture by assessing essential knowledge and skills that contribute to the culminating performances. We recommend that students be given regular opportunities to engage in self-assessment or peer assessment to help them become more mindful of how their work measures up against design standards.

Stage 3. Plan Learning Experiences and Instruction

With clearly identified results (enduring understandings) and appropriate evidence of understanding in mind, educators can *now* plan instructional activities. Several key questions must be considered at this stage of backward design:

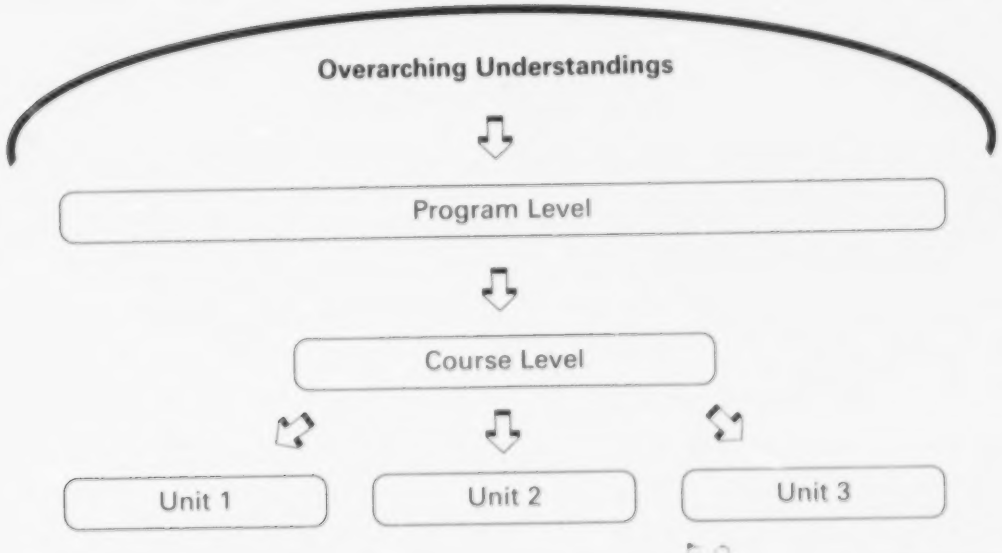
- What enabling knowledge (facts, concepts, and principles) and skills (procedures) will students need to perform effectively and achieve desired results?
- What activities will equip students with the needed knowledge and skills?
- What will need to be taught and coached, and how should it best be taught, in light of performance goals?
- What materials and resources are best suited to accomplish these goals?
- Is the overall design coherent and effective?

Note that the specifics of instructional planning—choices about teaching methods, sequence of lessons, and resource materials—occur *after* desired results and assessments are identified. Teaching is a means to an end. Having a clear goal helps to focus teacher planning and guide purposeful action toward the intended results.

■ ■ ■ ■ ■

The backward design process is applicable to the design of courses and programs of study as well as to individual units. Although the materials in this book focus primarily on the unit level, unit design should be considered in a larger context. Figure 2.2 depicts the linking of individual units to the overarching understandings that should frame courses and programs.

FIGURE 2.2 UNIT DESIGN IN A LARGER CONTEXT



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MISCONCEPTION ALERT

Beginning with a clear target or outcome, and developing a set of relevant performance-based inquiries and experiences, still do not make up backward design. The challenge is to postpone all thinking about what specific learning activities should frame a unit until the culminating performance tasks and other assessments are clear. Educators need to know precisely what performances are required by the end of the unit before they can know what specific experiences and learnings need to occur.

The temptation to build units around favored activities is great. This approach threatens to make the unit less coherent and goal directed from the students' point of view. And often the teacher hasn't stopped to consider what precisely should be assessed in such activities, given a specified target. The assessment often ends up evaluating the specifics of the activity instead of an understanding of the target. As a result, the activity, when used as a test of specific understandings, usually ends up yielding invalid or incomplete inferences.

REFLECTION FROM BOB JAMES

Let's watch the backward design process unfold inside the head of Bob James as he designs a three-week unit on nutrition.

Stage 1. Identify Desired Results

In reviewing our state standards in health, I found content standards on nutrition that are benchmarked to this age level:

- Standard 6: Students will understand essential concepts about nutrition and diet.
- Standard 6a: Students will use an understanding of nutrition to plan appropriate diets for themselves and others.
- Standard 6c: Students will understand their own eating patterns and ways in which these patterns may be improved.

Using these standards as the starting point, I need to decide what is the enduring understanding I want my students to take away from the unit. I think that what I'm really after is, *Students will use an understanding of the elements of good nutrition to plan a balanced diet for themselves and others.*

This understanding is clearly important, because planning nutritious menus is a real-life application that students can use throughout adulthood. I'm still a little unclear about how an understanding goes beyond the use of specific knowledge. The basic concepts of nutrition are fairly straightforward, after all, as are the skills of menu planning.

Stage 2. Determine Acceptable Evidence

This will be a bit of a stretch for me. Typically in a three- to four-week unit like this one, I give one or two quizzes, have a project, which I grade, and conclude with a unit test, generally multiple choice or matching. Although this approach to assessment makes grading and justifying the grades fairly easy, I have come to realize that these assessments don't always reflect the most important understandings of the unit. To be honest, I tend to test what is easy to test instead of assessing what is most important, namely the understandings and attitudes students should take away above and beyond nutritional facts. One thing that has always disturbed me is that the kids tend to focus on their grades rather than on their learning. Perhaps the way I've used assessments—more for grading than for documenting learning—has contributed somewhat to their attitude. Now I need to think about what would actually serve as evidence of the enduring understanding I'm after.

Stage 3. Plan Learning Experiences and Instruction

This is my favorite part of planning—deciding what activities the students will do and what resources and materials we'll need for those activities. But according to what I'm learning about backward design, I'll need to think first about what essential knowledge and skills my students will need in order to demonstrate the important understandings I'm after. Well, they'll need to know about the different food groups and the types of foods found in each group so that they will understand the USDA food pyramid recommendations. They will also need to know about human nutritional needs for carbohydrates, protein, sugar, fat, salt, vitamins, and minerals, and about the various foods that provide them. They'll have to learn about the minimum daily requirements for these

nutritional elements and about various health problems that arise from poor nutrition. In terms of skills, they will have to learn how to read and interpret the nutrition fact labels on foods and how to scale a recipe up or down, because these skills are necessary for their culminating project: planning healthy menus for a three-day camp program.

Now for the learning experiences. I'll use resources that I've collected during the past several years—a pamphlet from the USDA on the food groups and the food pyramid recommendations, a wonderful video, *Nutrition and You,* and, of course, our health textbook, which I now plan to use selectively. As I have for the past three years, I will invite the nutritionist from the local hospital to present information about diet and health and to discuss ways to plan healthy menus. I've noticed that the kids really pay attention to a real-life user of the nutrition information that they're learning.

My teaching methods will follow my basic pattern—a blend of direct instruction, inductive (constructivist) methods, cooperative learning group work, and individual activities.

Planning backward has helped me more clearly specify what knowledge and skills are really essential, given my goals for the unit. I'll be able to better concentrate on the most important topics (and relieve some guilt that I am not covering everything). I also realize that although some sections of the textbook chapters on nutrition will be especially useful (for instance, the descriptions of health problems arising from poor nutrition), other sections are not as informative as other resources I'll now use (the pamphlet from the USDA and the video). I now know more clearly what I need to assess using traditional quizzes and tests, and why a performance task and project are needed—to have students demonstrate their understanding. I think I'm getting the feel for backward design.

MODULE 3

The Understanding by Design Template

We think that a good template or design frame serves as an "intelligent" tool. It provides more than a place to write in our ideas. It focuses and guides our thinking throughout the backward design process to make high-quality work a more likely result.
—Wiggins & McTighe, 1998, p. 180

USING THE MODULE

The Understanding by Design template provides a format for developing, reviewing, and sharing units of study. Each page of the five-page template contains key questions to help a user focus on the three stages of backward design (identify desired results, determine acceptable evidence, and plan learning experiences and instruction). A graphic organizer format provides space for recording design ideas in both draft and final form.

The template pages are presented in three ways in this module:

- A blank version of the template packet is presented at the end of this module (see Worksheets 3.1–3.6). Worksheet 3.1 is a Unit Cover Page, and Worksheets 3.2–3.6 are the template pages.
- Directions for completing the pages are given in Figures 3.1–3.4. (Directions are not needed for two pages, Worksheet 3.1 and Worksheet 3.5.)
- An example of a completed template packet for a 5th grade unit on nutrition is given in Figures 3.5–3.10.

The template *form* offers a means to succinctly present a unit design; the template's *function* is to guide the backward design process. When completed,

the template can be used for self-assessment, peer review, and sharing of the unit design with others.

Unit Cover Page

The Unit Cover Page (Worksheet 3.1) contains sections to record basic descriptive information; show links to the appropriate national, state, or district content standards; summarize a unit; and list the contents of a unit design packet, including accommodations for special needs students and enrichment extensions. Space for adding Key Words (see the first section) is included for listing additional words and phrases that can be used in searching an electronic database of unit designs.

The bottom section includes space to record a unit's development status—initial draft, revised draft, review by peers, independent review by content experts, field testing (trying out the unit in various classrooms), validation (testing the unit against design standards), and anchoring (selecting examples of student work to illustrate performance levels). Module 20 presents design standards and accompanying tests for reviewing and validating unit designs. Module 21 describes the peer review process in detail.

Stage 1 Template Page

The first page of the template (Worksheet 3.2) focuses on Stage 1 of the backward design process. Box A asks designers to identify the enduring, big ideas worthy of understanding. Enduring understandings may include *overarching* understandings—transferable ideas that transcend the particulars of a unit—as well as *topical* understandings—specifics that students should understand about the unit topic. We recommend that the understandings listed in Box A be framed as generalizations or propositions, rather than stated as topics. Essential questions used to frame the enduring understandings are placed in Box B. At the bottom (Box C) is space for listing the key knowledge and skills to be developed through the unit.

Stage 2 Template Pages

The next three pages of the template (Worksheets 3.3–3.5) focus on Stage 2 of backward design. They provide graphic organizers for specifying the assessment plan for the unit in light of the desired results identified in Stage 1. They prompt

the designer to consider and specify a variety of assessment methods best suited for gathering sufficient evidence of the desired learnings in the unit.

Worksheet 3.3 asks the designer to summarize all the assessments for the unit. Worksheet 3.4 is a performance task blueprint for recording a more complete description of an authentic task, the required student products and performances, and the criteria against which each product or performance will be judged. A separate performance task blueprint is used for each task in the unit. The last template page for Stage 2 (Worksheet 3.5) offers a blueprint for other evidence, where supplementary assessments (e.g., quizzes, prompts, and observations) may be described. The worksheet shows space for describing two supplementary assessments.

Stage 3 Template Page

Worksheet 3.6 focuses on Stage 3 of backward design, the learning experiences and instruction needed to develop the targeted knowledge, skills, and understandings. Unit designers provide a sequence of the learning activities and lessons most likely to hook the students, sustain their interest, help develop the desired understandings, and equip students for their culminating performances. Teachers are encouraged to consider the WHERE elements from the *student's* perspective as they plan the major learning experiences. This page of the template calls for listing the major activities and lessons, not exhaustive lesson plans.

To help guide you through the three stages of the backward design process, we provide a road map (Figure 3.11). We matched the alphabet letters (A–H) on the Understanding by Design template pages (Worksheet 3.2–3.6) to the modules that explain how to complete the pages. For example, Modules 4 and 5 explain how to complete Box A on the template page for Stage 1 of the backward design process.

Electronic Design Template

In addition to the paper version presented here, the Understanding by Design template can easily be built in electronic form. An electronic version offers several advantages:

MISCONCEPTION ALERT

■ The Understanding by Design template provides a framework for generating and recording ideas. Users should not feel compelled to fill in *all* the boxes on the template pages if the information is not needed.

■ When completed, the template provides a summary of a unit's main components. Space constraints, however, limit the amount of information that can be recorded on the pages. In most cases, students and other teachers will need additional directions and materials. Such additions may be appended to the template.

■ Though intended to guide a unit's development, the template should not be thought of as providing all needed process materials to complete a finished product. Indeed, a key goal of this handbook is to provide worksheets and design tools to assist educators as they plan a unit. Think of the template, then, as equivalent to the 1040 tax form: It provides the general structure for the required information, but must be supplemented by other forms and worksheets to complete the tax return with all of the 1040 boxes filled in. In this regard, the template should be thought of as a place to record the final unit (product), as opposed to an ordered set of process worksheets.

■ The unit design template is structured by the logic of backward design: identify desired results; determine needed assessment evidence; and *then* plan learning experiences and instruction. Though the logic is sound and recommended as an overall strategy, initial users of the template sometimes display a misconception—the belief that they must follow the sequence laid out by the template boxes. In reality, designs can and do begin in many different places (e.g., starting with a content standard or an effective performance task). Furthermore, a clarification of one design element will often lead to a rethinking of a previously completed section of the template. Recognition of the nonlinear and iterative nature of the design process led to the modular organization of this handbook to provide the flexibility of sequence needed in a process that is recursive and personal as opposed to linear and standardized.

■ Designers can add their ideas directly onto the template using a computer.

■ Editing and revising are easy, a significant feature because ongoing refinement is crucial to achieving high-quality curriculum designs.

■ Units can be readily shared across schools and districts.

We have formed a Designers Cooperative for this purpose, using a template accessible on the World Wide Web.[1] In addition, work is currently under way to

[1] Information on the Designers Co-op is available by contacting the authors at their e-mail addresses (gwiggins@classnj.org and jmctighe@aol.com) or by logging onto the co-op Web site at http://www.classdesign.org.

establish a national database of validated curriculum units based on the Understanding by Design template. This searchable database, accessible on the Internet through the ASCD Web site (http://www.ubd.ascd.org), will enable educators to share their best designs as well as to access hundreds of validated units from other sites.

REFLECTION FROM BOB JAMES

This new template seems a bit overwhelming, but I think I can see the value of planning backward in this detailed way. For example, in Stage 1, visualizing the links between understandings, questions, and knowledge will sharpen priorities and help me get beyond just teaching the textbook content of nutrition. Although I've never liked having to fit my ideas into someone else's framework, I can see that this template organizes planning more than telling me how or what to teach. And it provides a practical format for sharing unit designs with other teachers. I must admit that I really like the idea of having access to a large database of units on the Internet. What a great resource for beginning and experienced teachers alike.

FIGURE 3.1

Corresponds to WS 3.2

STAGE 1

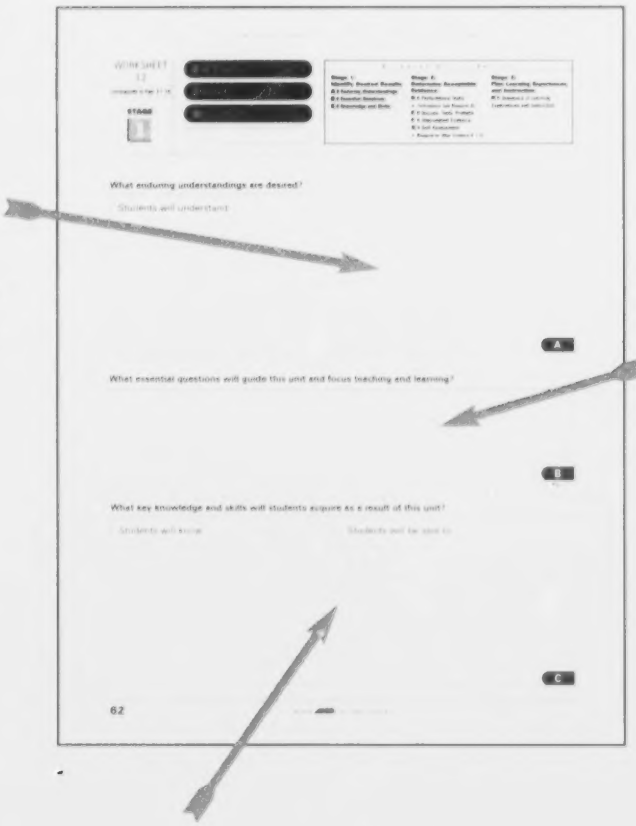
IDENTIFY DESIRED RESULTS

Directions

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings	D ▸ Performance Tasks	H ▸ Sequence of Learning Experiences and Instruction
B ▸ Essential Questions	➤ Performance Task Blueprint (D)	
C ▸ Knowledge and Skills	E ▸ Quizzes, Tests, Prompts	
	F ▸ Unprompted Evidence	
	G ▸ Self-Assessment	
	➤ Blueprint for Other Evidence (E, F, G)	

Identify the enduring understandings to be developed during this unit. You may choose to include overarching understandings that transcend the unit, as well as topical understandings specific to the unit. Understandings should be framed as generalizations or propositions. .


What enduring understandings are desired?
Students will understand
A
What essential questions will guide this unit and focus teaching and learning?
B
What key knowledge and skills will students acquire as a result of this unit?
C
62

Identify essential questions that will guide teaching and stimulate inquiry toward the desired topical understandings, and beyond the topic toward overarching understandings.

Identify knowledge and skills to be developed during this unit. Include key facts, concepts, principles, skills, and processes in two areas:

- Those called for by the content standards.
- Those needed by students to reach desired understandings.

Note: This section is asking for key knowledge and skills, not every discrete objective listed in textbooks or curriculum guides.

61

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FIGURE 3.2

Corresponds to WS 3.3

STAGE 2

DETERMINE ACCEPTABLE EVIDENCE

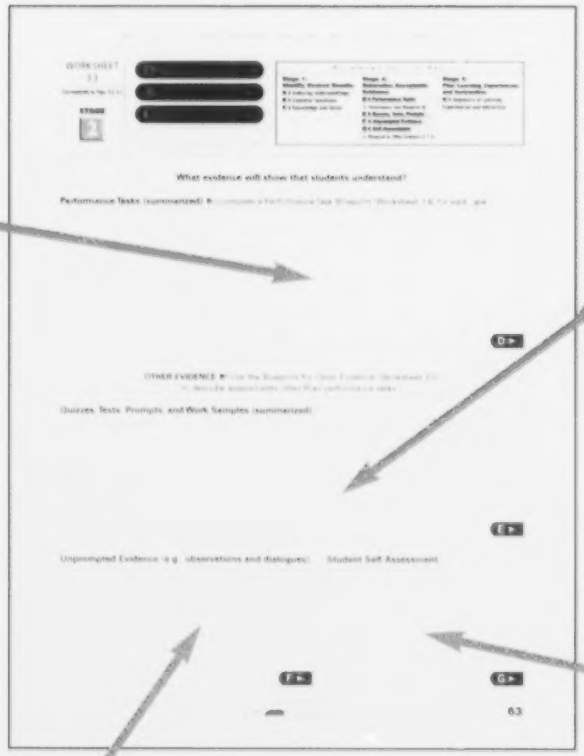
Directions

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings	D ▸ Performance Tasks	H ▸ Sequence of Learning Experiences and Instruction
B ▸ Essential Questions	➢ Performance Task Blueprint (D)	
C ▸ Knowledge and Skills	E ▸ Quizzes, Tests, Prompts	
	F ▸ Unprompted Evidence	
	G ▸ Self-Assessment	
	➢ Blueprint for Other Evidence (E, F, G)	

List the titles of the performance tasks in which students apply what they have learned in a new context to provide evidence of their understanding. Complete a separate Performance Task Blueprint (Worksheet 3.4) for each task. Attach related scoring tools (e.g., rubrics).

Note: Include formative tasks used during the unit as well as culminating performances.



Identify quizzes, tests, prompts, and work samples that will be used to assess key knowledge and skills.

List student self-assessments required in the unit.

Identify assessment information that will be obtained through observation, spontaneous interactions, and other informal means.

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FIGURE 3.3

Corresponds to WS 3.4

STAGE 2

➤ D

PERFORMANCE TASK BLUEPRINT

Directions

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
➤ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

Provide a summary of the performance task through which students will demonstrate understanding. Include the goal, role, audience, situation, product or performance, and standards (GRASPS) in the task description.

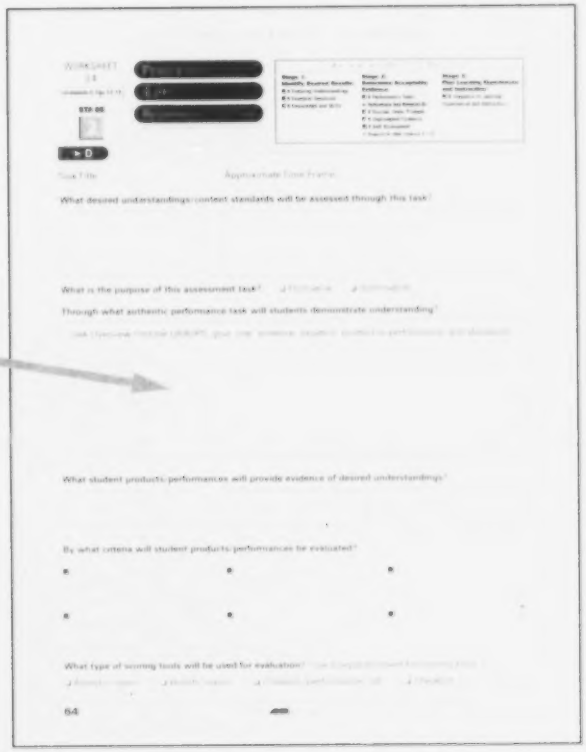
What desired understandings/content standards will be assessed through this task?
What is the purpose of this assessment task?
Through what authentic performance task will students demonstrate understanding?
What student products/performances will provide evidence of desired understandings?
By what criteria will student products/performances be evaluated?
What type of scoring tools will be used for evaluation?
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FIGURE 3.4

Corresponds to WS 3.6

STAGE 3

PLAN LEARNING EXPERIENCES AND INSTRUCTION

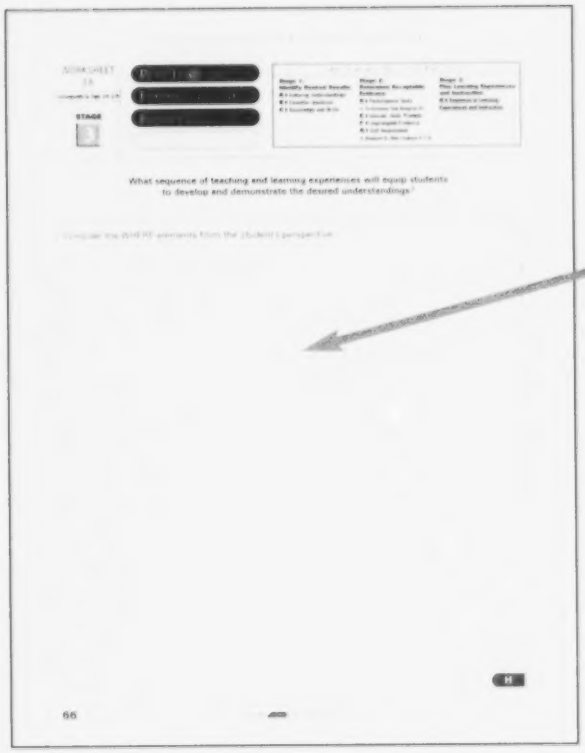
Directions

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A ▸** Enduring Understandings
- **B ▸** Essential Questions
- **C ▸** Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D ▸** Performance Tasks
  - ➤ Performance Task Blueprint (D)
- **E ▸** Quizzes, Tests, Prompts
- **F ▸** Unprompted Evidence
- **G ▸** Self-Assessment
  - ➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H ▸** Sequence of Learning Experiences and Instruction


What sequence of teaching and learning experiences will equip students to develop and demonstrate the desired understandings?
H
66

Provide a sequence for the major teaching and learning experiences that will most likely hook the students, hold their interest, help develop the desired understandings, and prepare students for their culminating performance.

The WHERE elements should be considered from the *student's* perspective.

W = Help students know *where* the unit is going.
H = *Hook* students and *hold* their interest.
E = *Equip* students, *explore* the issues, and *experience* the ideas.
R = Provide opportunities to *rethink* and *revise*.
E = Allow students to *exhibit* their understanding and *evaluate* their work.

Note: This section is asking for a chronology of the main lessons and learning activities, not detailed lesson plans.

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FIGURE 3.5

Corresponds to WS 3.1

UNIT COVER PAGE

Nutrition Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ▹ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ▹ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

Unit Title: "You Are What You Eat" Grade Levels: 5th

Subject/Topic Areas: health and nutrition

Key Words: nutrition, health, wellness, balanced diet, food pyramid

Unit Designer: Bob James Time Frame: three weeks

School District: Montgomery Knolls P.S. School: Cheshire Cat Elem.

Link to Content Standards

Standard 6: Students will understand essential concepts about nutrition and diet.

- Standard 6a: Students will use an understanding of nutrition to plan appropriate diets for themselves and others.
- Standard 6c: Students will understand their own eating patterns and ways in which these patterns may be improved.

Brief Summary of Unit (including curriculum and unit goals)

In this introductory unit of the health education course, students will learn about human nutritional needs, the food groups, the nutritional benefits of various foods, the USDA Food Guide Pyramid, and health problems associated with poor nutrition. They will design an illustrated nutrition brochure to teach younger children about the importance of good nutrition for healthy living; work in cooperative groups to analyze a hypothetical family's diet, recommending ways to improve its nutritional value; and research health problems resulting from poor eating. In the culminating performance task, students will develop and present a proposed menu for an upcoming three-day Outdoor Education camp program. Their menu for meals and snacks should meet the USDA food pyramid recommendations. The unit will conclude with students evaluating their personal eating habits and the extent to which they "eat healthy."

Unit Design Packet

CONTENTS	STATUS
☑ Completed template pages	☑ Initial draft (date: 3/12/98)
☐ Completed blueprint for each performance task	☑ Revised draft (date: 1/14/99)
☑ Completed blueprint for other evidence	☑ Peer reviewed
☐ Directions to students and teachers	☐ Content reviewed
☐ List of materials and resources	☐ Field-tested
☐ Suggested accommodations	☐ Validated
☐ Suggested extensions	☐ Anchored

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FIGURE 3.6

Corresponds to WS 3.2

STAGE 1

IDENTIFY DESIRED RESULTS

Nutrition Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

What enduring understandings are desired?

Students will understand

- A balanced diet contributes to physical and mental health.
- The USDA food pyramid presents relative guidelines for nutrition.
- Dietary requirements differ for individuals, depending on variables such as age, activity level, weight, and overall health.
- Healthful living requires an individual to act on available information on such topics as diet, exercise, sleep, and hygiene, even if those actions mean breaking comfortable habits.

A

What essential questions will guide this unit and focus teaching and learning?

- What is healthful eating?
- Can a healthy diet for one person be unhealthy for another?
- Why does the United States have so many health problems that are caused by unhealthy lifestyles, despite all the available information?

B

What key knowledge and skills will students acquire as a result of this unit?

Students will know

- Key terms (e.g., protein, fat, calorie, carbohydrate, and cholesterol).
- Types of foods in each food group and their nutritional values.
- The USDA food pyramid guidelines.
- Variables influencing nutritional needs.
- Health problems caused by poor nutrition..

Students will be able to

- Read and interpret nutrition information on food labels.
- Analyze diets for nutritional value.
- Plan balanced diets for themselves and others.

C

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FIGURE 3.7

Corresponds to WS 3.3

STAGE 2

DETERMINE ACCEPTABLE EVIDENCE

Nutrition Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ➤ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction

What evidence will show that students understand?

Performance Tasks (summarized) ➤(Complete a Performance Task Blueprint [Worksheet 3.4] for each task.)

- *Family Meals.* Students evaluate the eating habits of a hypothetical family (the Spratts) and make recommendations for a diet that will improve the nutritional value of their meals.
- *You Are What You Eat.* Students create an illustrated brochure to teach younger children about the importance of good nutrition for healthful living.
- *Chow Down.* Students develop a three-day menu for meals and snacks for an upcoming Outdoor Education camp experience.

D ➤

OTHER EVIDENCE ➤(Use the Blueprint for Other Evidence [Worksheet 3.5] to describe assessments other than performance tasks.)

Quizzes, Tests, Prompts, and Work Samples (summarized)

Quiz 1: The food groups

Quiz 2: The USDA food pyramid

Prompt: Describe two health problems that can arise as a result of poor nutrition and explain how these can be avoided.

E ➤

Unprompted Evidence (e.g., observations and dialogues)

- Teacher observations of students during work on the performance tasks and in the cafeteria while teacher is on cafeteria duty.

F ➤

Student Self-Assessment

- Self-assess your brochure.
- Self-assess the camp menu.
- Self-assess the extent to which you "eat healthy" at the end of the unit compared to the beginning of the unit.

G ➤

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FIGURE 3.8

Corresponds to WS 3.4

STAGE 2

➤ D

PERFORMANCE TASK BLUEPRINT

Nutrition Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
➤ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

Task Title: *Chow Down* Approximate Time Frame: *Two periods (plus out-of-class work)*

What desired understandings/content standards will be assessed through this task?

Standard 6a. Students will use an understanding of nutrition to plan appropriate diets for themselves and others.

What is the purpose of this assessment task? ❑ Formative ☑ Summative

Through what authentic performance task will students demonstrate understanding?

Task Overview (include GRASPS: goal, role, audience, situation, product or performance, and standards)

Because we have been learning about nutrition, the camp director at the Outdoor Education Center has asked us to propose a nutritionally balanced menu for our three-day trip to the center later this year. Using the USDA food pyramid guidelines and the nutrition facts on food labels, design a plan for three days, including the three meals and three snacks (morning, afternoon, and campfire time). Your goal: a tasty and nutritionally balanced menu. In addition to your menu, prepare a letter to the director explaining how your menu meets the USDA nutritional guidelines. Include a chart showing a breakdown of the fat, protein, carbohydrates, vitamins, minerals, and calories.

What student products/performances will provide evidence of desired understandings?

Menu with chart of nutritional values

Letter to camp director

By what criteria will student products/performances be evaluated?

- Menu meets USDA guidelines.
- Nutritional values chart is accurate and complete.
- Explanation of nutritional value and taste appeal of proposed menu is effective.

What type of scoring tools will be used for evaluation? (Use a separate sheet for scoring tools.)

☑ Analytic rubric ❑ Holistic rubric ❑ Criterion (performance) list ❑ Checklist

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FIGURE 3.9

Corresponds to WS 3.5

STAGE 2

➤ EFG

BLUEPRINT FOR OTHER EVIDENCE

Nutrition Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
➤ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

What other assessment evidence will be collected during this unit?

What will be assessed?
☑ Knowledge ☐ List: The food groups; USDA food pyramid
☐ Skill
☐ Understanding

How will evidence be collected?
☑ Quiz/Test ☐ Assignment
☐ Teacher notes ☐ Other: _____

What type of assessment will be used?
☑ Selected response ☐ Observation
☐ Academic prompt ☐ Work sample
☐ Brief constructed response ☐ Other: _____

What is the assessment's purpose?
☐ Diagnostic ☑ Formative ☐ Summative

Describe the assessment and state the prompt (if applicable).

Two multiple-choice quizzes from the textbook will be used during the unit to check for knowledge of the food groups and the USDA Food Guide Pyramid.

By what criteria will student responses be evaluated? (Complete if applicable.)

- _____
- _____

What type of scoring tools will be used for evaluation? (Check if applicable.)
☐ Analytic rubric ☐ Checklist
☐ Holistic rubric ☑ Answer key
☐ Criterion list

What will be assessed?
☑ Knowledge ☐ List: Specific health problems caused by poor nutrition
☐ Skill
☐ Understanding

How will evidence be collected?
☐ Quiz/Test ☐ Assignment
☑ Teacher notes ☐ Other: _____

What type of assessment will be used?
☐ Selected response ☐ Observation
☑ Academic prompt ☐ Work sample
☐ Brief constructed response ☐ Other: _____

What is the assessment's purpose?
☐ Diagnostic ☐ Formative ☑ Summative

Describe the assessment and state the prompt (if applicable).

Prompt: Describe two health problems that can arise as a result of poor nutrition and explain how these can be avoided.

By what criteria will student responses be evaluated? (Complete if applicable.)

- *Accurate:* Correctly links health problems with accompanying nutritional deficiencies or excesses.
- *Complete:* Identifies two health problems and their related nutritional causes.

What type of scoring tools will be used for evaluation? (Check if applicable.)
☑ Analytic rubric ☐ Checklist
☐ Holistic rubric ☐ Answer key
☐ Criterion list

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FIGURE 3.10

Corresponds to WS 3.6

STAGE 3

PLAN LEARNING EXPERIENCES AND INSTRUCTION

Nutrition Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings B ▸ Essential Questions C ▸ Knowledge and Skills	D ▸ Performance Tasks ➤ Performance Task Blueprint (D) E ▸ Quizzes, Tests, Prompts F ▸ Unprompted Evidence G ▸ Self-Assessment ➤ Blueprint for Other Evidence (E, F, G)	H ▸ Sequence of Learning Experiences and Instruction

What sequence of teaching and learning experiences will equip students to develop and demonstrate the desired understandings?

Consider the WHERE elements from the *student's* perspective.

1. Present the story of the sailors' "mystery" disease (scurvy) to hook students to consider the relationship of nutrition to health.
2. Introduce essential questions and key vocabulary terms.
3. Present concept attainment lesson on food groups, and then categorize foods accordingly.
4. Have students read and discuss the nutrition brochure from the USDA.
5. Present lesson on the food pyramid and identify foods in each group.
6. Read and discuss relevant selections from the health textbook.
7. Present and discuss the video *Nutrition and You*.
8. Have students design an illustrated nutrition brochure to teach younger children about the importance of good nutrition for healthy living.
9. Assess and give feedback on the brochures; allow students to assess their own and their peers' brochures, using a performance list.
10. Using cooperative groups, have students analyze a hypothetical family's diet and make recommendations for improved nutrition.
11. Conduct a group review and give feedback on the diet analyses.
12. Have students listen to and question a guest speaker (e.g., a hospital nutritionist) about health problems caused by poor nutrition.
13. Have students research health problems resulting from poor eating.
14. Model how to interpret food label information for nutritional value; have students practice.
15. Allow students to work independently to develop the three-day camp menu.
16. Observe and coach students as they work on their menus.
17. Evaluate and give feedback on the camp menu project; have students assess their own and their peers' projects, using rubrics.
18. Conclude the unit with students' self-evaluating their personal eating habits (i.e., the extent to which they "eat healthy").

H

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FIGURE 3.11

Guide for the Backward Design Process

The guide below outlines the three stages of the backward design process. Alphabet letters from the Understanding by Design template pages are shown under the appropriate stage of the process. The number of the module that explains how to complete the pages is shown on the right.

MODULE

Backward Design Process ——► 2

STAGE 1 — **Identify Desired Results**

- A *Enduring Understandings* ——► 4–5
- B *Essential Questions* ——► 6
- C *Knowledge and Skills* ——► 4–5

STAGE 2 — **Determine Acceptable Evidence** ——► 7

- D *Performance Tasks* ——► 8–11
  - ➤ *Performance Task Blueprint (D)* ——► 8–11

Other Evidence ——► 7

- E *Quizzes, Tests, Prompts* ——► 7
- F *Unprompted Evidence* ——► 7
- G *Self-Assessment* ——► 7
  - ➤ *Blueprint for Other Evidence (E, F, G)* ——► 7

STAGE 3 — **Plan Learning Experiences and Instruction**

- H *Sequence of Learning Experiences and Instruction* ——► 12–19

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WORKSHEET 3.1

Corresponds to Fig. 3.5

UNIT COVER PAGE

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

Unit Title:

Grade Levels:

Subject/Topic Areas:

Key Words:

Unit Designer:

Time Frame:

School District:

School:

Link to Content Standards

Brief Summary of Unit (including curriculum and unit goals)

Unit Design Packet

CONTENTS	STATUS
❑ Completed template pages ❑ Completed blueprint for each performance task ❑ Completed blueprint for other evidence ❑ Directions to students and teachers ❑ List of materials and resources ❑ Suggested accommodations ❑ Suggested extensions	❑ Initial draft (date: _____) ❑ Revised draft (date: _____) ❑ Peer reviewed ❑ Content reviewed ❑ Field-tested ❑ Validated ❑ Anchored

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WORKSHEET 3.2

Corresponds to Figs. 3.1, 3.6

STAGE 1

IDENTIFY DESIRED RESULTS

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
► Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
► Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

What enduring understandings are desired?

Students will understand

A

What essential questions will guide this unit and focus teaching and learning?

B

What key knowledge and skills will students acquire as a result of this unit?

Students will know

Students will be able to

73

C

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WORKSHEET 3.3

Corresponds to Figs. 3.2, 3.7

STAGE 2

DETERMINE ACCEPTABLE EVIDENCE

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ➤ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction

What evidence will show that students understand?

Performance Tasks (summarized) ➤(Complete a Performance Task Blueprint [Worksheet 3.4] for each task.)

D ➤

OTHER EVIDENCE ➤(Use the Blueprint for Other Evidence [Worksheet 3.5] to describe assessments other than performance tasks.)

Quizzes, Tests, Prompts, and Work Samples (summarized)

E ➤

Unprompted Evidence (e.g., observations and dialogues)

F ➤

Student Self-Assessment

G ➤

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WORKSHEET 3.4

Corresponds to Figs. 3.3, 3.8

STAGE 2

➤ D

PERFORMANCE TASK BLUEPRINT

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings	D ▸ Performance Tasks	H ▸ Sequence of Learning Experiences and Instruction
B ▸ Essential Questions	➤ Performance Task Blueprint (D)	
C ▸ Knowledge and Skills	E ▸ Quizzes, Tests, Prompts	
	F ▸ Unprompted Evidence	
	G ▸ Self-Assessment	
	➤ Blueprint for Other Evidence (E, F, G)	

Task Title: Approximate Time Frame:

What desired understandings/content standards will be assessed through this task?

What is the purpose of this assessment task? ❑ Formative ❑ Summative

Through what authentic performance task will students demonstrate understanding?

Task Overview (include GRASPS: goal, role, audience, situation, product or performance, and standards)

What student products/performances will provide evidence of desired understandings?

By what criteria will student products/performances be evaluated?

-
-
-
-
-
-

What type of scoring tools will be used for evaluation? (Use a separate sheet for scoring tools.)

❑ Analytic rubric ❑ Holistic rubric ❑ Criterion (performance) list ❑ Checklist

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WORKSHEET 3.5

Corresponds to Fig. 3.9

STAGE 2

➤ EFG

BLUEPRINT FOR OTHER EVIDENCE

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
➤ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

What other assessment evidence will be collected during this unit?

What will be assessed?
- ❑ Knowledge ❑ List: _____
- ❑ Skill _____
- ❑ Understanding _____

How will evidence be collected?
- ❑ Quiz/Test ❑ Assignment
- ❑ Teacher notes ❑ Other: _____

What type of assessment will be used?
- ❑ Selected response ❑ Observation
- ❑ Academic prompt ❑ Work sample
- ❑ Brief constructed response ❑ Other: _____

What is the assessment's purpose?
❑ Diagnostic ❑ Formative ❑ Summative

Describe the assessment and state the prompt (if applicable).

By what criteria will student responses be evaluated? (Complete if applicable.)
- ■
- ■

What type of scoring tools will be used for evaluation? (Check if applicable.)
- ❑ Analytic rubric ❑ Checklist
- ❑ Holistic rubric ❑ Answer key
- ❑ Criterion list

What will be assessed?
- ❑ Knowledge ❑ List: _____
- ❑ Skill _____
- ❑ Understanding _____

How will evidence be collected?
- ❑ Quiz/Test ❑ Assignment
- ❑ Teacher notes ❑ Other: _____

What type of assessment will be used?
- ❑ Selected response ❑ Observation
- ❑ Academic prompt ❑ Work sample
- ❑ Brief constructed response ❑ Other: _____

What is the assessment's purpose?
❑ Diagnostic ❑ Formative ❑ Summative

Describe the assessment and state the prompt (if applicable).

By what criteria will student responses be evaluated? (Complete if applicable.)
- ■
- ■

What type of scoring tools will be used for evaluation? (Check if applicable.)
- ❑ Analytic rubric ❑ Checklist
- ❑ Holistic rubric ❑ Answer key
- ❑ Criterion list

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WORKSHEET 3.6

Corresponds to Figs. 3.4, 3.10

STAGE 3

PLAN LEARNING EXPERIENCES AND INSTRUCTION

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings **B** ▸ Essential Questions **C** ▸ Knowledge and Skills	**D** ▸ Performance Tasks ➢ Performance Task Blueprint (D) **E** ▸ Quizzes, Tests, Prompts **F** ▸ Unprompted Evidence **G** ▸ Self-Assessment ➢ Blueprint for Other Evidence (E, F, G)	**H** ▸ Sequence of Learning Experiences and Instruction

What sequence of teaching and learning experiences will equip students to develop and demonstrate the desired understandings?

Consider the WHERE elements from the *student's* perspective.

H

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STAGE 1

IDENTIFY DESIRED RESULTS

Modules 4–6

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ◗ Enduring Understandings
- **B** ◗ Essential Questions
- **C** ◗ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ◗ Performance Tasks
- ➤ Performance Task Blueprint (D)
- **E** ◗ Quizzes, Tests, Prompts
- **F** ◗ Unprompted Evidence
- **G** ◗ Self-Assessment
- ➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ◗ Sequence of Learning Experiences and Instruction

MODULE 4

Identifying Enduring Understandings

How does one go about determining what is worth understanding amid a range of content standards and topics?
—Wiggins & McTighe, 1998, p. 10

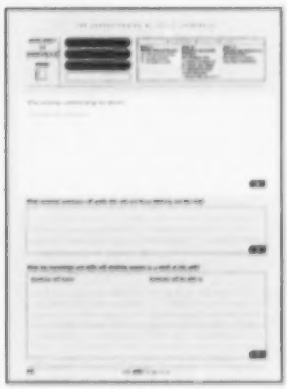
USING THE MODULE

Because there is typically more content than can reasonably be addressed within the available instructional time, educators are obliged to make choices. A useful framework for establishing curricular priorities may be graphically depicted using three nested rings, shown in Figure 4.1.

The blank background within the middle ring represents the field of possible content (topics, skills, and resources) that might be examined during a unit or course. Clearly, as educators, we cannot address it all; thus, we move within the largest ring to identify knowledge that students should be *familiar with*. During the unit or course, what do we want students to hear, read, view, research, or otherwise encounter? For example, in an introductory course on classroom assessment, it makes sense for adult students to be conversant with the history of standardized testing in the United States and in other nations (see Figure 4.2). Broad-brush knowledge, assessed through traditional quiz or test questions, would be sufficient, given the purpose of the course.

In the middle ring, we sharpen our choices by specifying *important* knowledge (facts, concepts, and principles) and skills (processes, strategies, and methods). We would say that student learning is incomplete if the unit or course concluded without mastery of these essentials. For instance, the characteristics of, and distinctions

Worksheet 3.2



A *Enduring Understandings*

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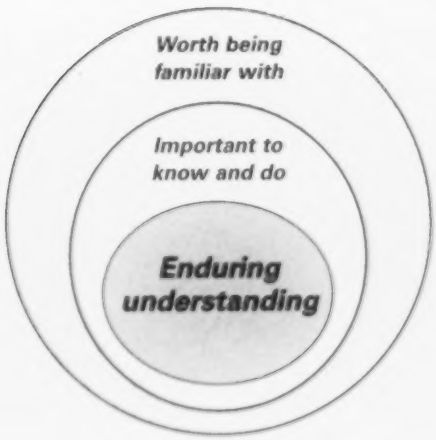
FIGURE 4.1 · FRAMEWORK FOR ESTABLISHING CURRICULAR PRIORITIES



between, norm- and criterion-referenced assessments would be considered essential knowledge in the assessment course, and some use of that knowledge would properly be expected. Here is another way to think about the middle ring. It specifies the prerequisite knowledge and skill students need to successfully accomplish key performances.

The smallest ring requires finer-grain choices and a focus on intellectual priorities. Here we select the *enduring* understandings that will anchor the unit and establish a rationale for it. The term *enduring* refers to the big ideas, or the important understandings, that we want students to "get inside of" and retain after they've forgotten many of the details. Put differently, the enduring understandings provide a larger purpose for learning the targeted content. They implicitly answer the question, Why is this topic worth studying? For the assessment course, the instructor would emphasize the principles of validity and reliability—through analysis and critiquing of would-be tests, followed by actual test design work—and the distinctions in theory and practice between norm- and criterion-referenced evaluation.

How do educators determine what is worth understanding from among a range of content standards, topics, and goals and objectives? We offer four criteria, or filters, to use in selecting big ideas and core processes to teach for understanding.

■ **To what extent are the content standards and topics *enduring and transferable big ideas, having value beyond the classroom?***

Enduring understandings go beyond discrete facts or skills to focus on larger concepts, principles, or processes. They are transferable—applicable to new situations within or beyond the subject. For example, we study the enactment of the Magna Carta as a specific historical event *because* of its significance to a larger idea. That idea is the "rule of law," whereby written laws specify the limits of a government's power and articulate the rights of individuals, such as due process. This big idea transcends its roots in 13th century England to become a cornerstone of modern democratic societies. Students can use this understanding in new situations, such as when studying emerging democracies in the third world.

A big idea may be described as an intellectual linchpin. A linchpin is the pin that keeps a wheel in place on an axle. Thus, a linchpin idea is one that is essential for understanding—without it, a student cannot go anywhere. For instance, without grasping the distinction between the letter and the spirit of the law, a student cannot understand the U.S. constitutional and legal system—even if the student is highly knowledgeable and articulate about the facts of U.S. history and law. Without a focus on transferable, linchpin ideas that have lasting value, the student may be left with inert, easily forgotten fragments of knowledge.

■ **To what extent are the content standards and topics *big ideas and core processes at the heart of the discipline?***

Consider the ways people work within the disciplines—conducting investigations in science; writing for different purposes (e.g., to inform, persuade, or entertain) to real audiences; interpreting events and primary source documents in history; applying mathematics to solve real-world problems; researching, critiquing books and movies; and debating issues of social and economic policy. Such authentic learning experiences shift students from a passive knowledge receiver into an active constructor and verifier of meaning. By involving students in "doing" the subject, we provide them with insights into how knowledge is generated, tested, and used.

■ **To what extent are the content standards and topics *abstract, counterintuitive, often misunderstood, or easily misunderstood ideas requiring uncoverage?***

Think about the abstract ideas in a unit or course, those concepts and principles that are not obvious and may be counterintuitive. For example, in physics students often struggle with ideas concerning gravity, force, and motion. When asked to predict which object—a marble or a bowling ball—will strike the ground first when dropped simultaneously from the same height, many students reveal a common misconception by incorrectly selecting the bowling ball.

What important concepts or processes do students have difficulty grasping? What do they frequently misunderstand? What do they typically struggle with? About which big ideas are they likely to harbor a misconception? These are fruitful topics to select and uncover—to teach for understanding.

■ **To what extent are the content standards and topics *big ideas embedded in facts, skills, and activities?***

Many seemingly straightforward facts are difficult to grasp without understanding the underlying concepts that give meaning to those facts. And many skills are only successfully mastered when we understand their intellectual purpose or justification. The fact that small objects fall to earth in the way they do only becomes understandable through the idea of gravitational force that similarly keeps planets in orbit. The skill of reading stories requires understanding that authors sometimes do not explicitly state what the story is about—their meaning resides between the lines.

None of these ideas for setting priorities and designing for better understanding is radical or new. Indeed, Bruner in *The Process of Education* (1960) made an elegant case almost 40 years ago for greater curricular focus on what matters most—powerful ideas with transfer:

> The curriculum of a subject should be determined by the most fundamental understanding that can be achieved of the underlying principles that give structure to a subject. . . . Teaching specific topics or skills without making clear their context in the broader fundamental structure of a field of knowledge is uneconomical. . . . An understanding of fundamental principles and ideas appears to be the main road to adequate transfer of training. To understand something as a specific instance of a more general case—which is what understanding a more fundamental structure means—is to have learned not only a specific thing but also a model for understanding other things like it that one may encounter (pp. 6, 25, and 31).

What is perhaps new is that we offer a set of tools (worksheets and filters) to make the selection of curriculum priorities more likely to happen by design than by good fortune. Several design tools have proven useful to educators striving to identify priorities and focus on big ideas within a unit of study or course. Figures 4.3 and 4.4 provide examples from a unit on nutrition and on the American Revolution. Figures 4.5–4.8 illustrate possible enduring understandings that resulted from running various content topics through the Understanding by Design filters. Try using the blank versions of these design tools (Worksheets 4.1 and 4.2) with content standards and topics from your curriculum.

MISCONCEPTION ALERT

A filter is not a criterion that all units must meet; it is a guideline for focusing a unit on important ideas worthy of understanding. Passing possible topics through the filters helps ensure the quality of the unit's ingredients, but it is not sufficient to judge the final design. That assessment requires a set of tests, based on design standards, once the unit is complete.

Consider the metaphor of drip coffee making, from which our filter analogy is borrowed. The paper filters out the grounds so that only coffee (not mere water or ground coffee) goes into the carafe. But the filter is not providing a criterion of good coffee; the final test of the coffee is whether it tastes good. Analogously, believable we have identified a big idea. It does not follow that our final unit will do justice to that idea. Nor are these filters the only ways to end up with a good idea. Similarly, we might even make good coffee using different or makeshift filters (e.g., we have no more paper ones in the house, but we find some cheesecloth to use). In terms of testing, all that matters is that the final unit (or cup of java) be right, not meet rules of being made a certain way.

REFLECTION FROM BOB JAMES

The basic concepts of nutrition are fairly straightforward, as are the skills of menu planning. So then, what are the important ideas worth understanding? What in the unit may require uncovering? One aspect of nutrition that isn't obvious to my students is the understanding that the USDA food pyramid provides a general set of guidelines for good nutrition, but that individual differences (in age, weight, activity level, and dietary restrictions) must be taken into account. In other words, a healthy diet for one individual may be inadequate for another.

As I reflect on my experience teaching nutrition, I've been frustrated by the fact that even when students know what "healthy eating" means, they don't always follow what they've learned; that is, they still eat too much junk food and too few fruits and vegetables. Maybe this is another aspect of nutrition that needs uncovering—exploring the idea of why people don't act on their knowledge with respect to eating (and other health matters, such as exercise). I think I'll try to uncover these two ideas in addition to teaching basic nutrition information.

FIGURE 4.2

Corresponds to WS 4.1

STAGE 1

ESTABLISHING CURRICULAR PRIORITIES

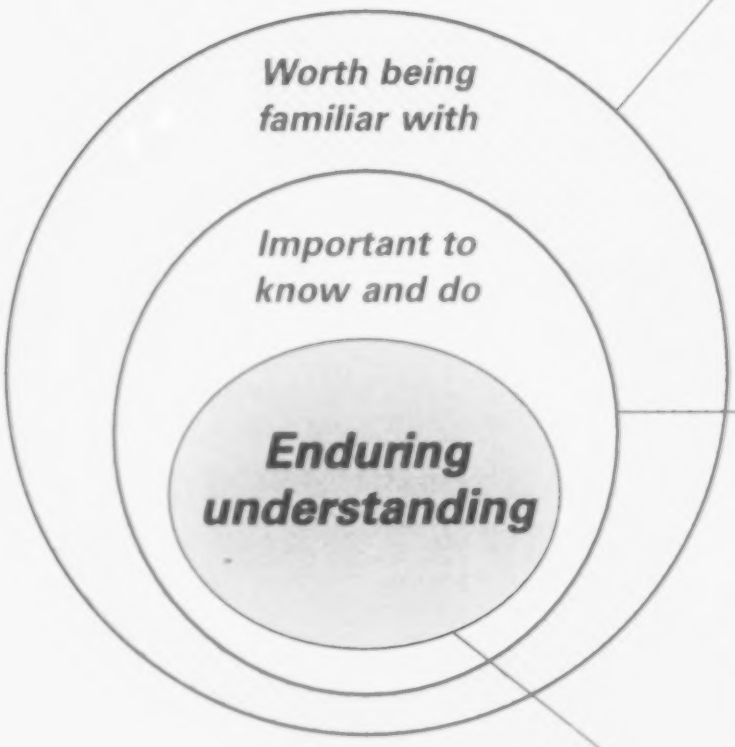
Assessment Course

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ▹ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ▹ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction



Knowledge that is worth being familiar with

- The history of standardized testing in the United States; how standardized testing has evolved over the years.
- Different purposes and uses of standardized tests.

Knowledge and skills that are important to know and do

- The concepts of validity and reliability.
- Distinctions between norm- and criterion-referenced evaluation.

Understandings that are enduring

- How to evaluate classroom assessments to determine if they are valid and reliable.
- How to develop valid and reliable assessments for _____.

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FIGURE 4.3

Corresponds to WS 4.1

STAGE 1

ESTABLISHING CURRICULAR PRIORITIES

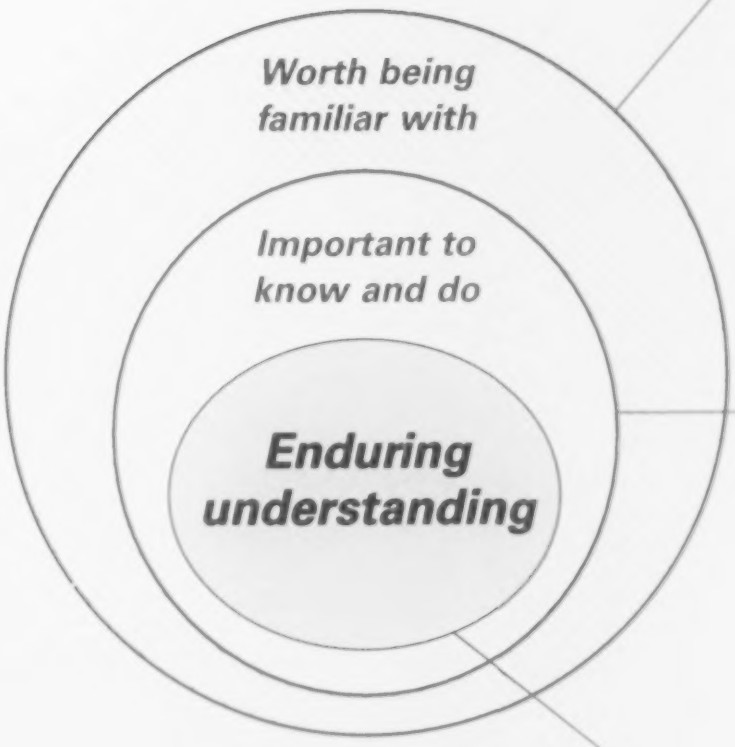
Nutrition Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
▸ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
P ▸ Unprompted Evidence
G ▸ Self-Assessment
▸ Blueprint for Other Evidence (E, P, G)

Stage 3: Plan Learning Experiences and Instruction
W ▸ Sequence of Learning Experiences and Instruction



Knowledge that is worth being familiar with

- General eating patterns and menus from the past.
- Different conditions requiring dietary restrictions (e.g., high blood pressure, diabetes, and stomach ulcers).

Knowledge and skills that are important to know and do

- Types of food in each of the food groups and their nutritional values.
- The USDA food pyramid guidelines.
- Interpret nutritional information on food labels.

Understandings that are enduring

- A balanced diet contributes to physical and mental health.
- Dietary requirements differ for individuals, depending on variables such as age, activity level, weight, and overall health.

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FIGURE 4.4

Corresponds to WS 4.1

STAGE 1

ESTABLISHING CURRICULAR PRIORITIES

American Revolution Unit

BACKWARD DESIGN PROCESS

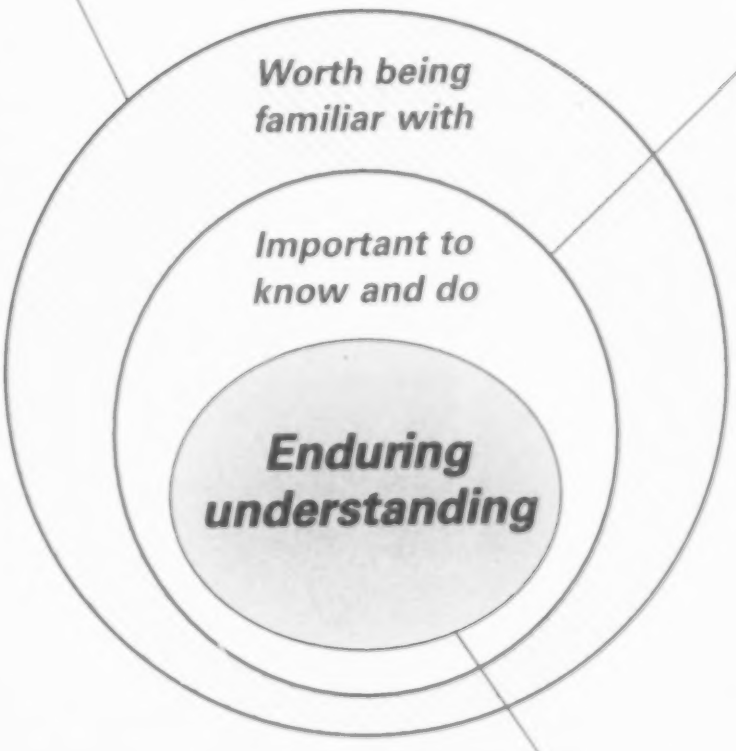
Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ▸ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ▸ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction

Knowledge that is worth being familiar with

- A few conflicting interpretations of the causes and meaning of the American Revolution.
- The way that particular groups of Americans (sailors; southern planters; New England farmers; merchants and craftspeople; African Americans, both enslaved and free; women; and American Indians) responded to the conflict with Great Britain and the sorts of changes each group experienced during that period.
- The evolution of the British colonies on the Atlantic seaboard since the early 17th century.



Knowledge and skills that are important to know and do

- The main events, social and economic structures, and ideas of the Revolutionary period, including shifts in British policy toward the colonies after 1763; various colonial responses to British policy moves; structure of colonial society in different regions; key turning points in the war; terms of the Treaty of Paris; changes in government and laws in the 1780s; evolution and main features of the Constitution; and key arguments during the ratification process.
- That historians differ about the causes and meaning of the American Revolution, from those who see in it a struggle for freedom and a new nation based on egalitarian and libertarian principles, to those who see it as an effort by the colonial elite to maintain the status quo and their place of dominance.

Understandings that are enduring

- Americans rebelled for many reasons, but not because their colonial governments had been long oppressed by the British. Ideals related to liberty and equality (e.g., "no taxation without representation") were developed by the colonial elite during this period (based on old ideas) to justify the rebellion. Once the ideals developed, they had different meanings for different people.
- A new nation was created during the American Revolution, but American nationalism was not a strong motivating force for the rebellion until its later years.

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FIGURE 4.5

Corresponds to WS 4.2

STAGE 1

Targeting Possible Understandings Using the Filters

Government Unit

Backward Design Process

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
▸ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Ungrompted Evidence
G ▸ Self-Assessment
▸ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

Unit Topics

Content Standards

Goals and Objectives

The Magna Carta was established on June 15, 1215.

☑ *Enduring, big ideas, having lasting value beyond the classroom.*

☐ *Big ideas and core processes at the heart of the discipline.*

☐ *Abstract, counterintuitive, and often misunderstood ideas.*

☐ *Big ideas embedded in facts, skills, and activities.*

Possible enduring understandings

- Democratic governments must balance the rights of individuals with the common good.
- A written constitution sets forth the terms and limits of a government's power.

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FIGURE 4.6

Corresponds to WS 4.2

STAGE 1

TARGETING POSSIBLE UNDERSTANDINGS USING THE FILTERS

Apples Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ▸ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ▸ Blueprint for Other Evidence (E, F, G)

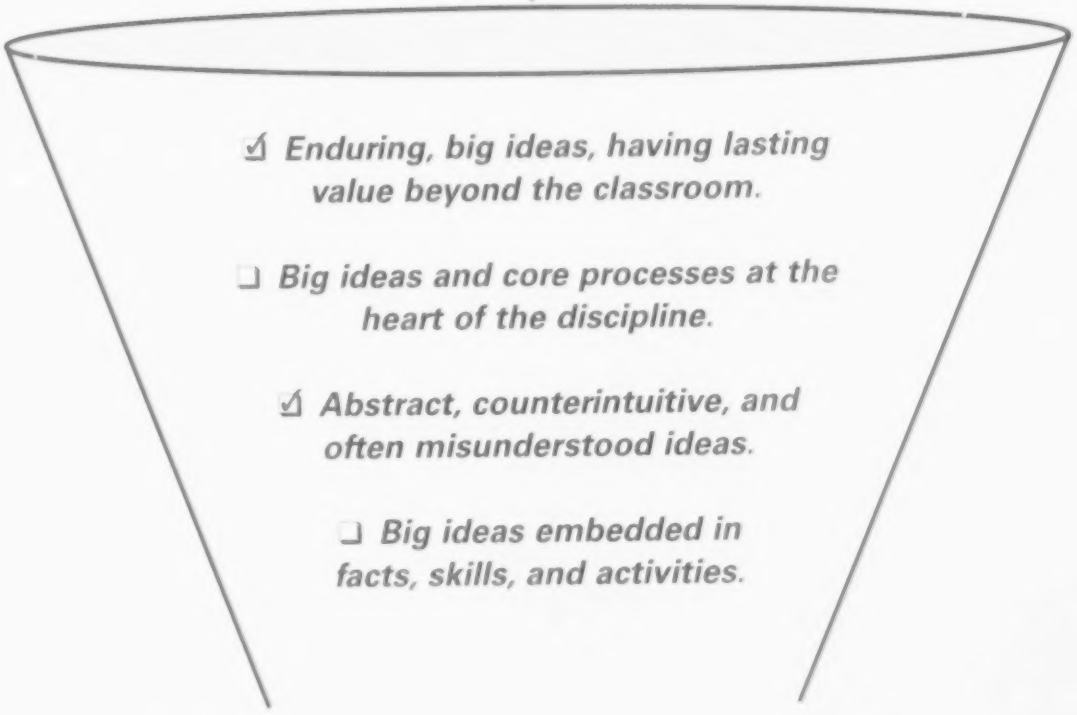
Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction

Unit Topics

Content Standards

Goals and Objectives

Interdisciplinary unit on apples


☑ Enduring, big ideas, having lasting value beyond the classroom.
❑ Big ideas and core processes at the heart of the discipline.
☑ Abstract, counterintuitive, and often misunderstood ideas.
❑ Big ideas embedded in facts, skills, and activities.

Possible enduring understandings

- Living things grow and change over time.
- Harvest time is celebrated by many cultures.
- The natural resources of a region influence the economy and lifestyles of its inhabitants.

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FIGURE 4.7

Corresponds to WS 4.2

STAGE 1

TARGETING POSSIBLE UNDERSTANDINGS USING THE FILTERS

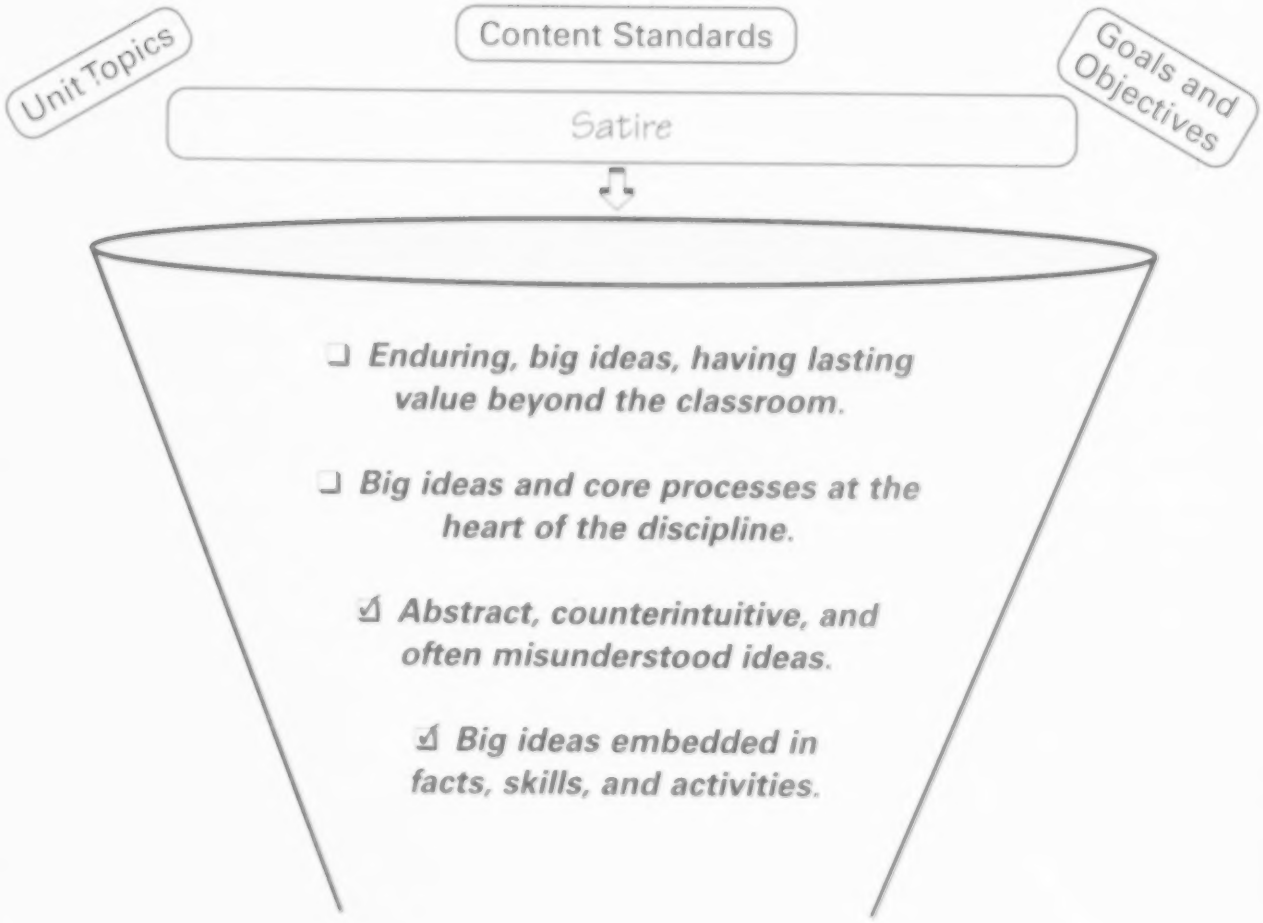
Satire Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction


Unit Topics
Content Standards
Goals and Objectives
Satire
❑ Enduring, big ideas, having lasting value beyond the classroom.
❑ Big ideas and core processes at the heart of the discipline.
☑ Abstract, counterintuitive, and often misunderstood ideas.
☑ Big ideas embedded in facts, skills, and activities.

Possible enduring understandings

- Authors do not always say exactly what they mean and mean what they say (literally).
- Satire attempts to expose and ridicule public or political immorality and stupidity through irony, sarcasm, or exaggeration. (Satire is not just making fun of other people.)

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FIGURE 4.8

Corresponds to WS 4.2

STAGE 1

TARGETING POSSIBLE UNDERSTANDINGS USING THE FILTERS

Scientific Method Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ▸ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ▸ Blueprint for Other Evidence (E, F, G)

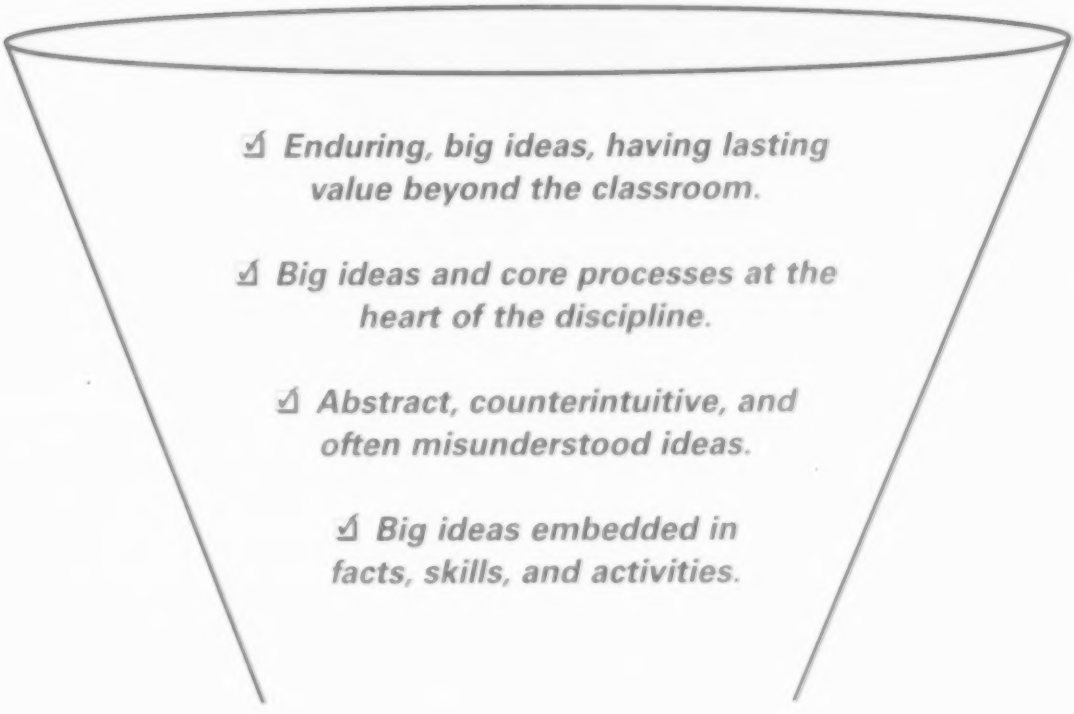
Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction

Unit Topics

Content Standards

Goals and Objectives

The scientific method


☑ Enduring, big ideas, having lasting value beyond the classroom.
☑ Big ideas and core processes at the heart of the discipline.
☑ Abstract, counterintuitive, and often misunderstood ideas.
☑ Big ideas embedded in facts, skills, and activities.

Possible enduring understandings

- Scientific knowledge develops through carefully controlled investigations.
- The scientific method deliberately isolates and controls key variables. (It is not simply trial and error.)

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WORKSHEET 4.1

Corresponds to Figs. 4.2-4.4

STAGE 1

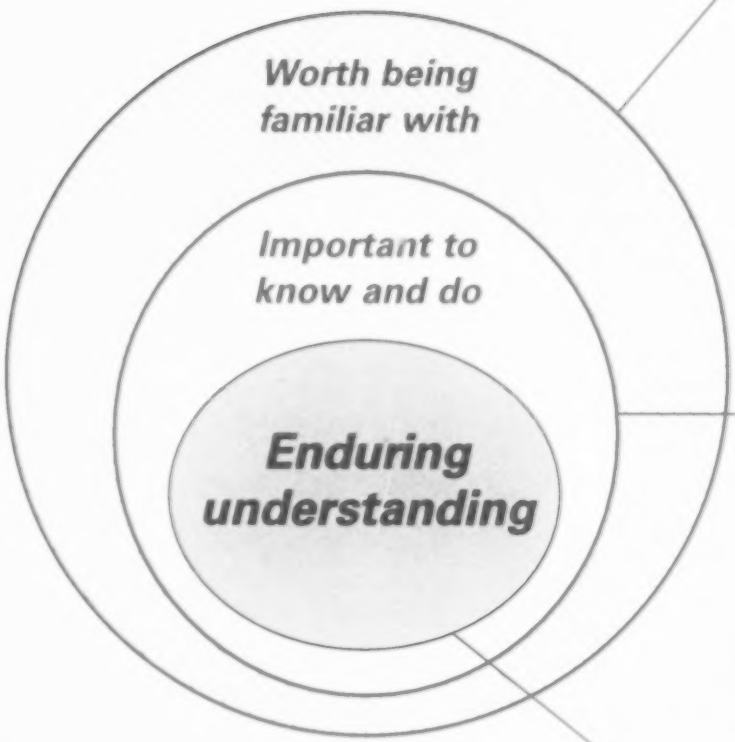
ESTABLISHING CURRICULAR PRIORITIES

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ▸ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ▸ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction



Knowledge that is worth being familiar with

Knowledge and skills that are important to know and do

Understandings that are enduring

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WORKSHEET 4.2

Corresponds to Figs. 4.5–4.8

STAGE 1

Targeting Possible Understandings Using the Filters

Backward Design Process

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

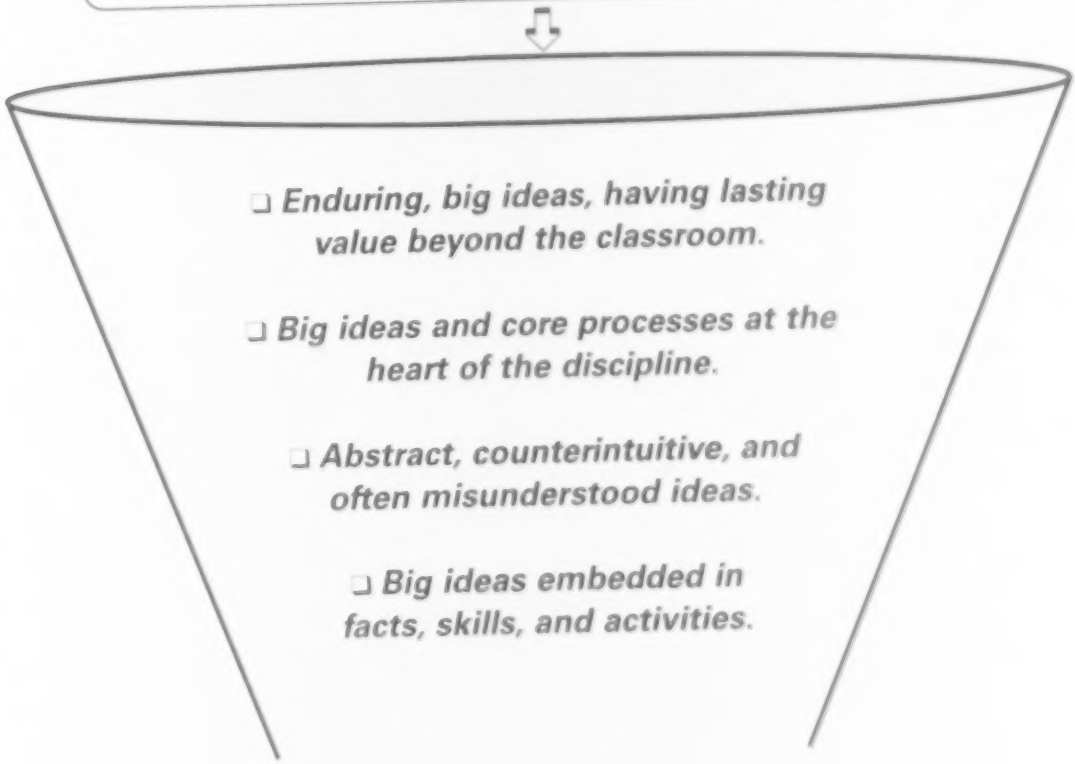
Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
▹ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Ungrompted Evidence
G ▸ Self-Assessment
▹ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

Unit Topics

Content Standards

Goals and Objectives


❑ Enduring, big ideas, having lasting value beyond the classroom.
❑ Big ideas and core processes at the heart of the discipline.
❑ Abstract, counterintuitive, and often misunderstood ideas.
❑ Big ideas embedded in facts, skills, and activities.

Possible enduring understandings

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MODULE 5

From Topics and Skills to Understandings

The design process and template call for stating a targeted understanding as a proposition, as opposed to stating it as a topic only. The aim is to state clearly what is to be learned, not merely what the area of inquiry will be; what the student should take away, not merely what the teacher will cover.

USING THE MODULE

In selecting understandings as the focus of a unit or course, designers are asked to state clearly what is to be understood. By stating the targeted understanding as a topic only, teachers typically offer a vague phrase about the content, instead of the specific understandings that are meant to result. To say, "I want students to understand the Civil War" or "I want students to understand friendship," is to say nothing about what, specifically, students should understand about those topics. Although saying, "I want students to understand the causes and effects of the Civil War" or "Friends are different from family," narrows the focus of the topic, these statements still do not specify exactly what insights into cause and effect the teacher wants students to leave with.

To provide greater clarity for teachers and students about what is most important, we recommend stating a desired understanding as a generalization or a proposition, not as a phrase or a word. Stating the desired understanding as a generalization provides a sharper target for teaching and assessing. For example, stating that a unit goal is for students to understand "the causes of the Civil War" does not say specifically *what* understanding about cause and effect is expected. By contrast, the statement, "The Civil War was fought over states' rights issues more than over the morality of slavery," is a full statement—a generalization summarizing the

Worksheet 3.2

A *Enduring Understandings*

C *Knowledge and Skills*

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intended insight, not just the topic. Stating desired understandings as specific generalizations makes it much easier for designer and student alike to realize what particular knowledge, activities, and assessments are needed to support that understanding. Similarly, an enduring understanding such as, "True friendship is revealed during hard times," sharpens the friendship unit.

All generalizations, no matter how specifically stated, are abstractions. What may be obvious to the teacher will not be obvious (yet) to students. In fact, many subtle concepts and counterintuitive ideas will typically have to be explored, grappled with, and tested if true understanding is to be achieved.

A unit aiming for understanding must therefore involve more than learning the generalization as a statement—as if it were a fact. Teaching will entail uncovering the understanding—not merely covering it—if the student is to be more than merely familiar with a claim and have insight into its meaning and importance. Indeed, the mere *stating* of intended understandings, either by the teacher or by the teacher pointing them out in the textbook, is *the* cardinal mistake of coverage, which treats complex ideas as words to be learned. Instead, teachers should be helping students explore the ideas' meaning and confirm their wisdom.

Enduring Understandings: Overarching and Topical

Some enduring understandings are more specific than others. Consider the generalizations in Figure 5.1. The examples suggest that understandings can be thought of as involving different degrees of abstraction and generalization. The understandings in Column 1 are more abstract or general than the related ones in Column 2. These targets can be described as "overarching understandings" because they provide a larger context and rationale for the specific unit understandings in Column 2. They point beyond the particulars toward more transferable knowledge. Column 2 shows topic-specific insights; we refer to them as "topical understandings." Both types may be placed in Box A of the template.

An emphasis on transferable big ideas (framed as overarching understandings) is key to effective teaching for understanding. Our goal as teachers is not merely to teach what is known or what we find delight in. It is to provide students with powerful sources of connection, insight, and application in present and future endeavors. Such work means focusing on big ideas that point beyond the

FIGURE 5.1 ENDURING UNDERSTANDINGS: OVERARCHING AND TOPICAL

ENDURING UNDERSTANDINGS	
Overarching	**Topical**
Art Great artists often break with established traditions, conventions, and techniques to better express what they see and feel.	*Unit on Impressionism* Impressionist artists used novel painting techniques to represent everyday life. They used color, light, and shadow to convey the impression of reflected light at a particular moment.
Literature The modern novel overturns many traditional story elements and norms to tell a more authentic and engaging narrative.	*Unit on* The Catcher in the Rye Holden Caulfield is an alienated antihero, not an average kid on an "excellent adventure."
History/Government A president is not above the law. Democracy requires a courageous, not just a free, press.	*Unit on the U.S. Constitution* The Watergate incident was a major constitutional crisis (not a third-rate burglary or healthy competition between political parties).
Science Gravity is not a physical thing but a term describing the rate of acceleration of falling objects.	*Unit on gravitational force* Vertical height, not the angle and distance of descent, determines the eventual speed of a falling object.
Economics Value is a function of supply and demand.	*Unit on money and introductory economics* A Beanie Baby's initial cost has little relation to its eventual worth. Demand and availability determine its value at any given time.
Mathematics Postulates logically precede any axiomatic system, but they are often developed long after the fact to justify key theorems.	*Unit on the parallel postulate* The parallel postulate is a crucial foundation to Euclidean geometry, despite its awkwardness and theoremlike nature.

particular content of a unit, thus giving schoolwork greater intellectual focus, coherence, and applicability.

Distinguishing between topical understandings and overarching understandings is not clear-cut. Such variables as the scope of course content, subject matter priorities, age of students, and time allotted to the unit influence the breadth of the targeted understandings. Nonetheless, we encourage designers to consider the following principles when selecting and framing both kinds of understandings:

■ Enduring understandings are of two kinds, topical and overarching. Topical understandings are specific to the unit topic. They involve generalizations derived from the specific content knowledge and skills of the unit. Overarching understandings are broader in scope. They involve generalizations that transcend the content knowledge of the unit, thus serving as bridges to other units and courses.

■ A unit should focus on a small number of transferable big ideas (overarching understandings).

■ Enduring understandings of both kinds are best stated as generalizations or propositions.

■ Although abstract, the targeted understandings must be stated unambiguously—as *specific* abstractions.

■ Overarching understandings typically focus on broader conceptual relationships than do topical understandings.

Skills and Understanding

As we repeatedly note in *Understanding by Design*, as well as in this handbook, our design work is based on a conditional: *If* you are aiming for understanding, *then* certain design moves follow. The conditional reflects that many appropriate goals in education do not demand in-depth understanding (e.g., skills, habits, attitudes, and factual knowledge). The template reflects this distinction by providing a place (Box C) to note separate knowledge and skill objectives for a unit.

But the distinction between skill and understanding is not as straightforward as it may first seem. Many skills-focused teachers in reading, world languages, physical education, and algebra, for example, have told us that they see no need to worry about big idea understandings because their teaching involves so little of such ideas. They often want to leave template Box A blank, where such understandings are placed.

Learning to de-code text, translate Spanish sentences into English, dribble a basketball, or solve simultaneous equations does indeed involve mostly skill. Any understanding here would seem to be at the low level of comprehending the rules of translation or application and the appropriate vocabulary to perform the skills in question. Indeed, one can become highly skilled in algebra, for example, without understanding what one is doing. One need not know *why* the algorithms work to come up with accurate answers.

We would argue, however, that important concepts and understandings are often implicit or embedded in all skill development. Unless one learns the underlying principles, rationales, or strategies implicit in a skill, developing true expertise would be impossible because the highest-level use of a skill invariably involves innovation, good judgment, and efficiency. To be skillful is to work purposefully and strategically, not merely to produce discrete moves on cue. Such efficiency and effectiveness require understanding some key principles at work, even if one is not self-consciously thinking about those principles or verbalizing them as one performs. (This theme is addressed in greater detail in Module 11 in a discussion of the need for authentic performance assessment of skill and understanding.)

The examples in Figure 5.2 make this difference clearer. Consider the skills in Column 1 and the corresponding embedded understandings in Column 2. The examples suggest that a few key strategic ideas or principles need to be taught along with the discrete skills if teachers wish to develop true proficiency.

Decisions on how much to emphasize these embedded understandings and how to address them—inductively or through up-front teaching—are not at issue at this point; those decisions must be made in Stage 3. Our aim here is to alert teachers that they may find, upon reflection and discussion, that worthwhile understandings are embedded in their skill objectives.

FIGURE 5.2 SKILLS COMPARED TO UNDERSTANDINGS

Skill	Understanding
Reading text	The author's meaning in a story is rarely explicit; one must read between the lines.
Creating scoring opportunities in soccer	One needs to create space, spreading the defense as broadly and deeply as possible.
Asking directions in Spanish	Knowing whether or not one has been understood requires attention to nonverbal as well as to verbal feedback.
Speaking persuasively in public	Persuasion often involves an emotional appeal to the particular wishes, needs, hopes, and fears of an audience, irrespective of how logical and rational the argument.

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MISCONCEPTION ALERT

■ Confusing district and state content standards with what we call enduring understandings is common. Novice designers often think that they need only write their district or state standards in Box A of the template. Those standards belong on the template Unit Cover Page. Even when the standards refer to understanding, however, their framing is usually inadequate for unit design. To say that a unit goal is, "Students will understand the water cycle," is insufficient. The designer must go one step further by identifying the *particular* understandings students will take away from their studies of the water cycle. In other words, the targets need to be framed as specific generalizations or propositions.

Framing an understanding as a generalization or proposition is necessary but insufficient. Simply stating a proposition does not ensure that the stated understanding is specific or enduring. For example, to want students to understand the proposition, "Life is unfair," is too vague to adequately serve the design of a unit linked to specific standards.

Similarly, to equate "proposition" or "generalization" with "sentence" is a misconception. The sentence, "Students will understand the causes and effects of the Civil War," is not a proposition. It doesn't propose a *specific* claim or insight about the Civil War that is worth understanding. It merely takes the topic and puts it in sentence form. (More examples of appropriately worded understandings are shown in Figures 5.3 and 5.4.)

■ A common phrase used in standard setting, "students will understand how to," presents a potential source of confusion in framing understandings.

■ Often, the phrase, "understand how to," is loosely used and meant as a synonym for "learn how to." When what is really being described is a straightforward, discrete skill (e.g., write in cursive or dribble a basketball), the desired achievement is a skill, not an understanding. Such discrete knowledge and skill objectives are placed in Box C on the template.

■ Learning a single technique or recipe is not the same as understanding how to do something. A common mistake, for example, is to simplistically operationalize the standard, "understand how to write persuasively," by teaching students how to write formulaic five-paragraph essays. At the very least, "understand how to" implies that students need to learn a *variety* of strategies for use in various contexts. In cases where no big idea understandings are at stake, place the skills in Box C of the template.

■ When, however, "understand how to" refers to a skill that requires thoughtful attention to underlying concepts and principles, then the teacher *is* dealing with understandings, as well as skills. For instance, "understand how to write persuasively" requires not only a set of skills and good judgment in their use across different

98 A

contexts and audiences, but also insight into the concept of persuasion. In this case, we place these writing skills in Box C and their companion understandings in Box A.

In our example, students need not only to understand *how* to perform as writers but also to understand *that* certain principles are at work in achieving any persuasive written performance. In learning to write persuasively, in other words, students are expected to understand the ideas that lie behind all successful persuasion (e.g., how advertising and political propaganda work). This element has an important implication for assessment—for gathering evidence of that understanding. A student might not be an effective writer but still reveal an understanding of how persuasion works (e.g., in critiques of essays, commercials, or propaganda). Or the reverse might occur: Because a teacher sees skill in writing a five-paragraph "persuasive essay" does not mean that the student really understands persuasion and how to accomplish it. The student may merely be an articulate, thoughtful writer.

Here, again, teachers still face the challenge of stating the particular insights desired about persuasion (or whatever skills are addressed). What *about* persuasion (or "the scientific method," or "best fit" graphing, or sailing) do we want students to understand? Thus, in addition to identifying both the understanding elements and skill elements in their respective boxes, curriculum designers should state the desired understanding as a generalization—for example—"Students will understand that successful persuasion often involves nonrational appeal to audience emotions and values."

MISCONCEPTION ALERT

(continued)

■ ■ ■ ■ ■

In this module, we provide a variety of worksheets and design tools to help designers move from topics and skills to topical and overarching understandings.[1] Worksheet 5.1 helps designers identify two types of enduring understandings—overarching and topical. Figures 5.3 and 5.4 present four examples for moving *from topics to understandings*. Designers can use Worksheet 5.2 for their own units.

Figures 5.5 and 5.6 offer four examples for moving *from a skill or process to understandings*. Worksheet 5.3 can be used for specific units. Figure 5.7 provides an example for moving *from content to topical understandings*; Figure 5.8, *from topical to overarching understandings*. Each has an accompanying worksheet (Worksheets 5.4 and 5.5, respectively). Figure 5.9 illustrates a strategy for linking concepts to form generalizations and has an accompanying worksheet (Worksheet 5.6).

[1] We wish to gratefully acknowledge Lynn Erickson for helping us refine our thinking on these matters. Many ideas in this module have evolved from her helpful critiques and examples. Readers interested in practical ideas for moving beyond the facts to enduring understandings are encouraged to read her excellent book, *Concept-Based Curriculum and Instruction* (Erickson, 1998).

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REFLECTION FROM BOB JAMES

I'm beginning to realize that my original targets for the unit are inadequate. The content standards for nutrition do not specify the particular understandings that my students are supposed to acquire. The standards merely state that students should understand the elements of good nutrition. After working through the Understanding by Design exercises, I'm much clearer about how to frame my unit goals as specific propositions. I will now focus on three main understandings: (1) A balanced diet contributes to physical and mental health; (2) the USDA food pyramid provides relative guidelines for nutrition; and (3) dietary requirements differ for individuals, depending on variables such as age, activity level, weight, and overall health.

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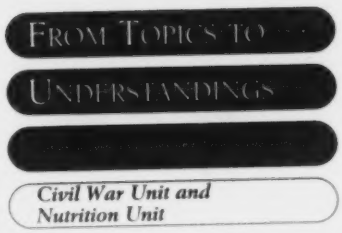
FIGURE 5.3



STAGE 1

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction

Consider the big ideas you want students to come to understand as a result of exploring a particular topic. The following examples illustrate the movement from a broad topic, to a focus on particular aspects of the topic, to specific understandings. Notice that the desired understandings are stated as specific, yet abstract, generalizations or propositions.

Phrased as a topic

the Civil War

Phrased as a more focused topic

causes and effects of the Civil War

Stated as specific generalizations

- The Civil War was fought primarily over states' rights issues linked to differences in regional economies (not over the morality of slavery, as commonly believed).
- The war's effects live on in national politics, regional economies, and cultural differences.

Phrased as a topic

nutrition

Phrased as a more focused topic

the elements of good nutrition

Stated as a specific generalization

The USDA food pyramid presents relative guidelines for a balanced diet because dietary requirements differ for individuals, depending on such variables as age, activity level, weight, and overall health.

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FIGURE 5.4

STAGE 1

FROM TOPICS TO UNDERSTANDINGS

Friendship Unit and Weather Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction

Consider the big ideas you want students to come to understand as a result of exploring a particular topic. The following examples illustrate the movement from a broad topic, to a focus on particular aspects of the topic, to specific understandings. Notice that the desired understandings are stated as specific, yet abstract, generalizations or propositions.

Phrased as a topic

friendship

Phrased as a more focused topic

the difference between friends, family, acquaintances, and teammates

Stated as a specific generalization

True friendship is revealed more through challenging times than during happy times.

Phrased as a topic

weather

Phrased as a more focused topic

causes of different types of severe weather

Stated as specific generalizations

- Weather and climate conditions occur as a result of the transfer of energy into and out of the earth's atmosphere.
- Energy from the sun heats the earth unevenly, causing air movements that produce changing weather patterns.
- When making predictions, weather forecasters must consider many variables, which are constantly changing.

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FIGURE 5.5

STAGE 1

FROM A SKILL OR PROCESS TO UNDERSTANDINGS

Swimming Course and Persuasive Writing Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings	D ▸ Performance Tasks	H ▸ Sequence of Learning Experiences and Instruction
B ▸ Essential Questions	➤ Performance Task Blueprint (D)	
C ▸ Knowledge and Skills	E ▸ Quizzes, Tests, Prompts	
	F ▸ Unprompted Evidence	
	G ▸ Self-Assessment	
	➤ Blueprint for Other Evidence (E, F, G)	

Consider the "understanding" elements of important *skills* and *processes* you teach. Identify the *concepts* that undergird those skills and processes. Study the following examples to see how underlying concepts are combined to form big idea understandings. Notice that these understandings are stated as specific *generalizations* or *propositions*.

Phrased as a skill

swimming: freestyle stroke mechanics

Underlying concepts

efficiency, maximum power, backward push, surface area

Stated as specific generalizations to be understood

- The most efficient and effective stroke mechanics involve pushing the maximum amount of water directly backward.
- A flat (versus cupped) hand palm offers the maximum surface area.
- A bent arm pull enables a swimmer to push water directly backward with greatest power.

Phrased as a skill

persuasive writing techniques

Underlying concepts

persuasion, goal, audience, influence, technique

Stated as specific generalizations to be understood

- A variety of specific techniques (e.g., bandwagon, personality appeal, and use of data) is used to influence people's thoughts and actions.
- The choice of particular persuasive techniques depends upon the goal (i.e., what do you want people to believe or do) and audience.

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FIGURE 5.6

STAGE 1

FROM A SKILL OR PROCESS TO UNDERSTANDINGS

Scientific Method and Metric Conversion Unit

BACKWARD DESIGN PROCESS		
Stage 1: Identify Desired Results A ▸ Enduring Understandings B ▸ Essential Questions C ▸ Knowledge and Skills	**Stage 2: Determine Acceptable Evidence** D ▸ Performance Tasks ➢ Performance Task Blueprint (D) E ▸ Quizzes, Tests, Prompts F ▸ Unprompted Evidence G ▸ Self-Assessment ➢ Blueprint for Other Evidence (E, F, G)	**Stage 3: Plan Learning Experiences and Instruction** H ▸ Sequence of Learning Experiences and Instruction

Consider the "understanding" elements of important *skills* and *processes* you teach. Identify the *concepts* that undergird those skills and processes. Study the following examples to see how underlying concepts are combined to form big idea understandings. Notice that these understandings are stated as specific *generalizations* or *propositions*.

Phrased as a process

the scientific method

Underlying concepts

investigation, variable, isolation, control

Stated as specific generalizations to be understood

- Scientific knowledge develops as a result of carefully controlled investigations.
- The scientific method deliberately isolates and controls key variables. (It is not simply trial and error.)

Phrased as a process

converting to metric measures

Underlying concepts

measure, standard, accuracy, conversion

Stated as specific generalizations to be understood

- Standardized measures allow people to accurately describe the physical world.
- We can measure the same thing with different measures (e.g., Fahrenheit and Centigrade.

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FIGURE 5.7

Corresponds to WS 5.4

STAGE 1

FROM CONTENT TO TOPICAL UNDERSTANDINGS

Statistics and Data Analysis Unit

BACKWARD DESIGN PROCESS

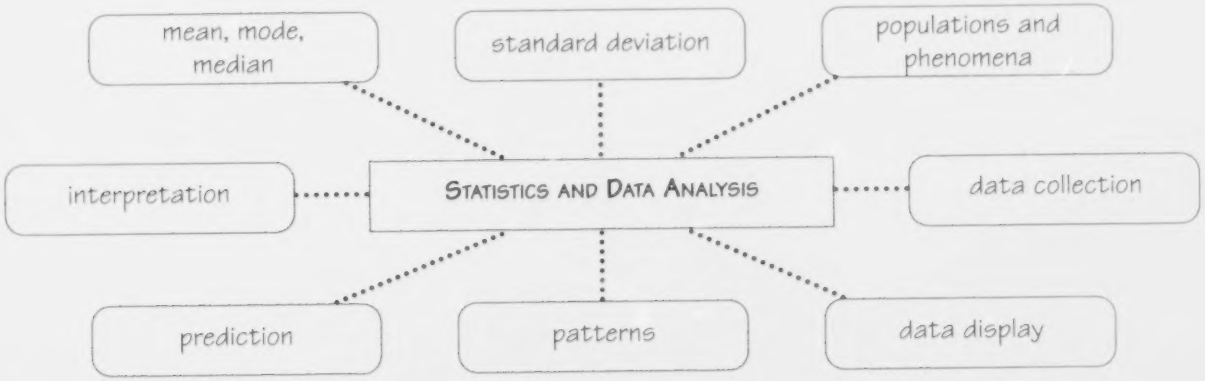
Stage 1: Identify Desired Results
- **A ▸ Enduring Understandings**
- **B ▸ Essential Questions**
- **C ▸ Knowledge and Skills**

Stage 2: Determine Acceptable Evidence
- **D ▸ Performance Tasks**
  - ➤ Performance Task Blueprint (D)
- **E ▸ Quizzes, Tests, Prompts**
- **F ▸ Unprompted Evidence**
- **G ▸ Self-Assessment**
  - ➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H ▸ Sequence of Learning Experiences and Instruction**

Try this process for developing topical understandings for a unit:

1. List the unit topic in the box at the center of the web.
2. Identify possible concepts that are involved in this topic and record them in the web boxes.
3. Push your thinking about possible unit concepts by asking of the topic:
   - What does knowing _____ enable you to do?
   - What idea underlies _____?
   - What couldn't we understand if we didn't know _____?
   - How and why do people outside school use _____?
   - What underlying issue/conflict/dilemma is involved in _____?



4. Combine two or more concepts from the web into sentences—generalizations that sum up understandings students should take away from the unit. Think about
   - Moral of the story for your unit.
   - Underlying unit theme or unobvious lesson to be learned.
   - Larger purpose or rationale for studying _____.

Use the web link worksheet (Worksheet 5.6) to brainstorm possibilities. Your goal is to develop one or more specific generalizations to serve as unit understandings.

Students will understand that

- **Statistics** *can describe* **populations and phenomena.**
- **Data analysis** *often reveals* **patterns** *and enables* **prediction.**
- *Choices in* **data collection** *and representation affect their* **interpretation** *and use.*

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FIGURE 5.8

Corresponds to WS 5.5

STAGE 1

From Topical to Overarching Understandings

Friendship Unit

Backward Design Process		
Stage 1: Identify Desired Results A ▸ Enduring Understandings B ▸ Essential Questions C ▸ Knowledge and Skills	**Stage 2: Determine Acceptable Evidence** D ▸ Performance Tasks ➢ Performance Task Blueprint (D) E ▸ Quizzes, Tests, Prompts F ▸ Unprompted Evidence G ▸ Self-Assessment ➢ Blueprint for Other Evidence (E, F, G)	**Stage 3: Plan Learning Experiences and Instruction** H ▸ Sequence of Learning Experiences and Instruction

Try this process for developing overarching understandings:

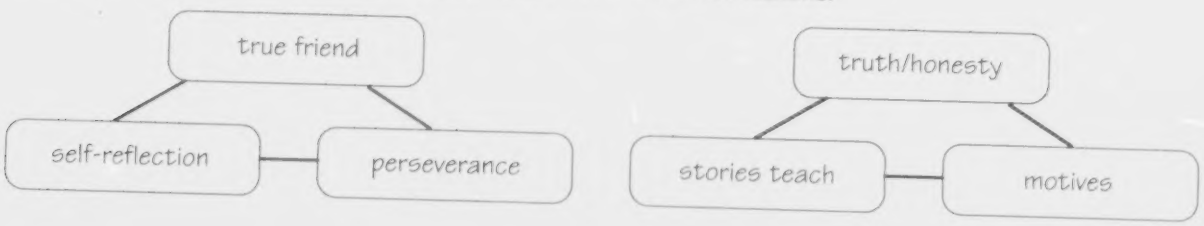
Unit

primary unit on friendship based on the story "Frog and Toad Are Friends."

1. List the key lessons (topical understandings) to be learned from the unit.

- Frog is willing to use a **white lie** to get Toad outdoors.
- Frog, like all **friends**, will **keep trying** to cheer up a friend.
- **The story reminds us** how friendship and our **motives** are complex.

2. Identify important and transferable concepts involved in these lessons.



3. Combine two or more of the concepts into broader generalizations or more abstract principles. Refine the generalizations by asking and answering of the unit: Why? How so? So what? Your goal is to develop one or more overarching understandings under which topical understandings fall.

- Friendship requires trust and honesty, yet the truth is sometimes stretched in the name of friendship.
- Stories can shed light on the complexities and inconsistencies in our relationships and ourselves.
- Friends are there for each other, through thick and thin.

4. Check those that apply. Are your understandings

❑ Big ideas? ❑ Transferable generalizations? ❑ Specific, yet abstract?

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FIGURE 5.9

Corresponds to WS 5.6

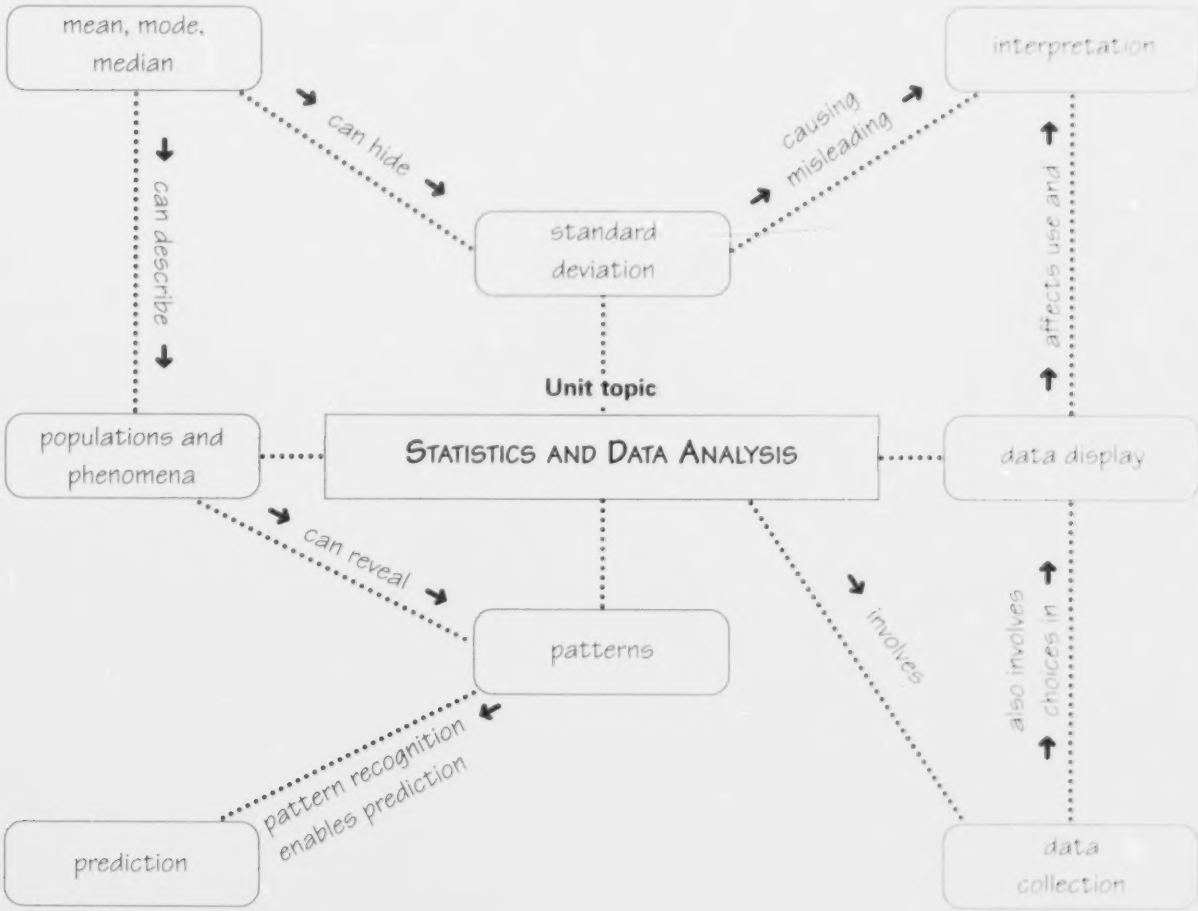
STAGE 1

Web Links: Linking Concepts to Form Generalizations

Statistics and Data Analysis Unit

Backward Design Process		
Stage 1: Identify Desired Results	**Stage 2: Determine Acceptable Evidence**	**Stage 3: Plan Learning Experiences and Instruction**
A ▸ Enduring Understandings	D ▸ Performance Tasks	H ▸ Sequence of Learning Experiences and Instruction
B ▸ Essential Questions	➢ Performance Task Blueprint (D)	
C ▸ Knowledge and Skills	E ▸ Quizzes, Tests, Prompts	
	F ▸ Unprompted Evidence	
	G ▸ Self-Assessment	
	➢ Blueprint for Other Evidence (E, F, G)	

Combine two or more concepts to form generalizations. Use linking verbs or verb phrases to connect the concepts.



Generalizations

- Statistics can describe phenomena or populations.
- Data analysis often reveals patterns and enables prediction.
- Choices in data collection and representation affect their interpretation and use.

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WORKSHEET 5.1

STAGE 1

Identifying Overarching and Topical Understandings

Backward Design Process		
Stage 1: Identify Desired Results A ▸ Enduring Understandings B ▸ Essential Questions C ▸ Knowledge and Skills	**Stage 2: Determine Acceptable Evidence** D ▸ Performance Tasks ➢ Performance Task Blueprint (D) E ▸ Quizzes, Tests, Prompts F ▸ Unprompted Evidence G ▸ Self-Assessment ➢ Blueprint for Other Evidence (E, F, G)	**Stage 3: Plan Learning Experiences and Instruction** H ▸ Sequence of Learning Experiences and Instruction

In the table below, identify possible enduring understandings for a unit of study. In Column 1, consider overarching, transferable understandings. In Column 2, identify what you want students to understand about the *particular* topics in this unit. Remember to state the desired understandings as generalizations or propositions.

To move *from topical to overarching understandings,* consider these questions:

- Why do I want students to understand _____? (topical understanding)
- What is the larger goal or purpose of understanding _____? (topical understanding)
- What general principles underlie _____? (topical understanding)

To move *from overarching to topical understandings,* consider these questions:

- What specific understandings for this topic follow from _____? (overarching understanding)
- What are some examples of particular understandings related to the unit topic that are subsumed under _____? (overarching understanding)
- What follows for the unit topic from the idea that _____? (overarching understanding)

Overarching Understanding	Topical Understanding

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WORKSHEET 5.2

STAGE 1

From Topics to Understandings

Backward Design Process		
Stage 1: Identify Desired Results **A ▸ Enduring Understandings** **B ▸ Essential Questions** **C ▸ Knowledge and Skills**	**Stage 2: Determine Acceptable Evidence** **D ▸ Performance Tasks** ➤ Performance Task Blueprint (D) **E ▸ Quizzes, Tests, Prompts** **F ▸ Unprompted Evidence** **G ▸ Self-Assessment** ➤ Blueprint for Other Evidence (E, F, G)	**Stage 3: Plan Learning Experiences and Instruction** **H ▸ Sequence of Learning Experiences and Instruction**

Use the following frames to move from a topic, to a more focused topic, to specific understandings. Remember to state the desired understandings as generalizations or propositions. Answer the following questions to help you move from a topic to specific understandings:

Topic

- What about _____ should students understand?
- What aspects of this topic will this unit focus on?

Phrase as a more focused topic.

- What specifically should students understand about _____?
- What do experts understand about _____, and why is it important?
- If the unit on _____ is a story, what's the moral of the story?
- What insights about _____ should students take away?

State as a specific understanding, framed as a generalization or proposition.

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WORKSHEET 5.3

STAGE 1

FROM A SKILL OR PROCESS TO UNDERSTANDINGS

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ➤ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

List a skill or process you teach. Identify the underlying concepts that would help students learn and apply the skill or process more effectively. Combine two or more concepts to form big idea understandings. State the understandings as specific generalizations or propositions. To help you consider the "understanding" elements contained within the skills or processes you teach, answer the following scaffolding questions as you work.

Skill or process

- What underlying concepts are involved when the skill or process is effectively applied?
- What ideas are embedded in the skill or process?

Identify underlying concepts.

- What do experts understand about this skill or process that novices do not?
- If students better understood _____, how might their performance improve?
- What understanding would help students learn and apply the skill or process more effectively?

State the skill or process as a specific generalization to be understood.

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WORKSHEET 5.4

Corresponds to Fig. 5.7

STAGE 1

FROM CONTENT TO TOPICAL UNDERSTANDINGS

BACKWARD DESIGN PROCESS

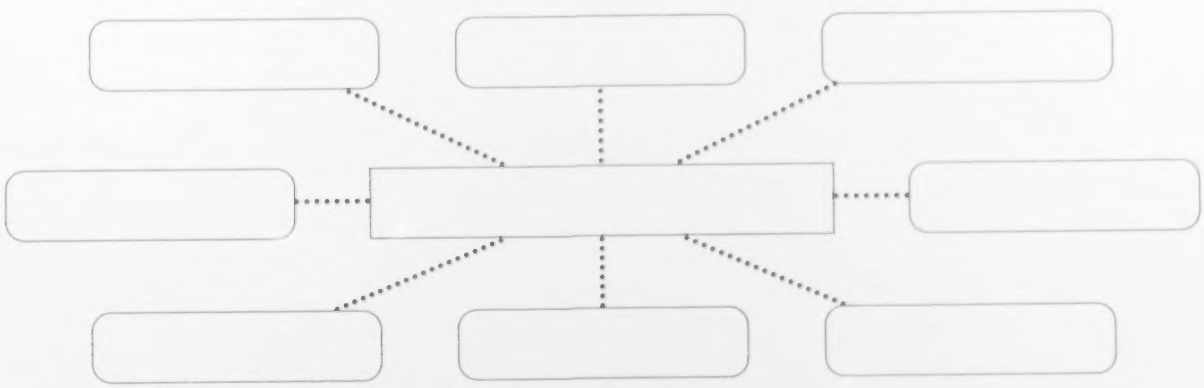
Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

Try this process for developing topical understandings for a unit:

1. List the unit topic in the box at the center of the web.
2. Identify possible concepts that are involved in this topic and record them in the web boxes.
3. Push your thinking about possible unit concepts by asking of the topic:
   - What does knowing _____ enable you to do?
   - What idea underlies _____?
   - What couldn't we understand if we didn't know _____?
   - How and why do people outside school use _____?
   - What underlying issue/conflict/dilemma is involved in _____?



4. Combine two or more concepts from the web into sentences—generalizations that sum up understandings students should take away from the unit. Think about
   - Moral of the story for your unit.
   - Underlying unit theme or unobvious lesson to be learned.
   - Larger purpose or rationale for studying _____.

Use the web link worksheet (Worksheet 5.6) to brainstorm possibilities. Your goal is to develop one or more specific generalizations to serve as unit understandings.

Students will understand that

-
-
-

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WORKSHEET 5.5

Corresponds to Fig. 5.8

STAGE 1

From Topical to Overarching Understandings

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

Try this process for developing overarching understandings:

Unit

1. List the key lessons (topical understandings) to be learned from the unit.

-
-
-
-

2. Identify important and transferable concepts involved in these lessons.

3. Combine two or more of the concepts into broader generalizations or more abstract principles. Refine the generalizations by asking and answering of the unit: Why? How so? So what? Your goal is to develop one or more overarching understandings under which topical understandings fall.

-
-
-

4. Check those that apply. Are your understandings

❑ Big ideas? ❑ Transferable generalizations? ❑ Specific, yet abstract?

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WORKSHEET 5.6

Corresponds to Fig. 5.9

STAGE 1

WEB LINKS: LINKING CONCEPTS TO FORM GENERALIZATIONS

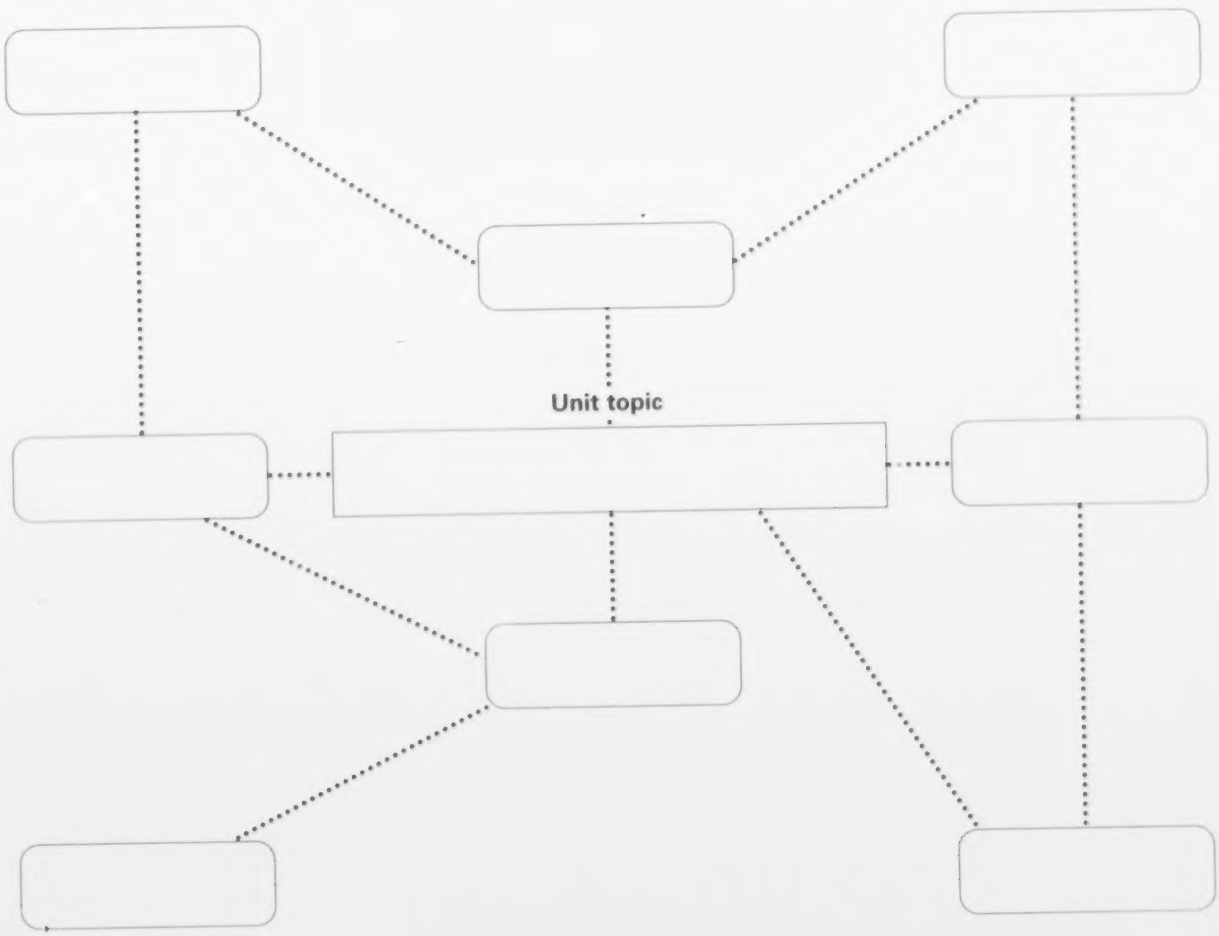
BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

Combine two or more concepts to form generalizations. Use linking verbs or verb phrases to connect the concepts.



Generalizations

-
-
-

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MODULE 6

Framing Units Around Essential Questions

Every statement has to be seen as a response to a question, and the only way to understand a statement is to get hold of the questions to which a statement is an answer.
—Gadamer, 1978, p. 106

Only a person who has questions can have knowledge. . . . To question means to lay open. As against the fixity of opinions, questioning makes an object [of knowledge] and all its possibilities fluid. . . . [One must] learn to see what is questionable.
—Gadamer, 1994, pp. 364–367

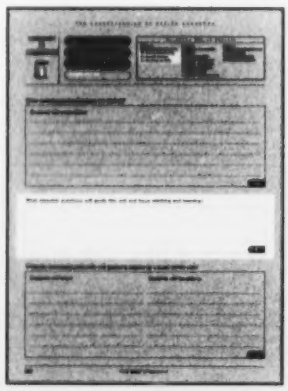
USING THE MODULE

One key design strategy for engaging student inquiry, uncovering subtle ideas, and developing understanding is to build curriculum around the kinds of questions that gave rise to the content knowledge in the first place. The creators of theories, theorems, extraordinary stories, and powerful images grappled with perplexing questions about puzzling facts or problems. So, too, must the learner be given an opportunity to ask probing questions that lead to deeper insights about a subject.

Such questions render a unit design more coherent, make a student's role more appropriately inquisitive, and a teacher's priorities more clearly focused. Without asking and pursuing such questions, the student is confronted with either a set of disconnected activities—resulting in minimal understanding of important ideas—or leading questions that point toward obvious, flat lessons to be dutifully learned. Without designing around provocative questions and big ideas, teaching easily succumbs into an activity- or coverage-orientation without clear priorities.

At the heart of all uncoverage, then, is the deliberate interrogation of the content to be learned, as opposed to just the teaching and learning of material. Although this focus may sound odd, it points to an important truth about coming to understand: Key ideas must be questioned, played with, and discovered to be useful if they are to be understood. Content that has not been questioned is like

Worksheet 3.2



B *Essential Questions*

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courtroom testimony that has not been examined, leading to a hodgepodge of opinions and beliefs instead of to knowledge.

Practically speaking, educators must reframe content standards and outcome statements into rich questions, and then design assignments and assessments to explore big ideas and evoke thoughtful and supportable answers. In contrast, most current curricular frameworks and standards documents make the mistake of framing core content as factlike sentences rather than revealing them to be summary insights, derived from questions and inquiries.

Look what happens, for example, to a few national standards in science when we transform them from declarative statements (suggesting memorized responses) to questions (suggesting engaging inquiries). The questions are derived from the national science standards (American Association for the Advancement of Science, 1993):

- Is nature systematic? In what sense is the body a system? Are all systems synergistic (more than the sum of their parts)?
- What are the strengths and weaknesses of models (e.g., light as a wave and the heart as a pump) in helping us understand the world? When have models helped and hindered the progress of science?
- Do scientific laws imply constancy? What is a law of nature, and how is it like or unlike social laws?
- Are all events or behavior caused? Can orderly patterns and formulas be found to explain all phenomena, even the most apparently random, lucky, or chaotic? Are patterns of change "out there" or in our heads?
- How are humans like and unlike other life forms?

Essential Questions

What specific questions might guide teaching and engage students in uncovering the important ideas at the heart of each subject? We might begin to identify such questions by using the format found in the quiz show *Jeopardy*. Given the content found in a textbook—the answers to be learned—what is an important question for which the textbook provides an answer? For instance, if balance of powers in U.S. government (a core idea) is the answer, then what is a good

question that would help students understand the idea and its value? In other words, What were some questions that founders of the United States asked themselves that led to their proposed constitution? An inquiry-generating question might be, What type of government best suits the fact that "all men are not angels" (to quote the *Federalist Papers*)? A more content-directed question for the same unit might be, What key reasons did the Federalists advance for a balance of powers, and was their particular solution wise in light of U.S. history?

We refer to such questions as "essential" because they suggest time-honored yet radical inquiries (in the sense of the word's etymology of "going to the roots") into core ideas. Consider the following examples of essential questions and notice how they differ from typical textbook or test questions:

- Does art reflect culture or shape it?
- How do effective writers hook and hold their readers?
- Must a story have a beginning, middle, and end?
- How does an organism's structure enable it to survive in its environment?
- What is wellness?
- Is history a history of progress?
- Who owns what and why?
- What makes places unique and different?

Essential questions such as these share common characteristics:

- *Have no one obvious right answer.* Essential questions are not intended to yield a pat answer. Rather, they serve as doorways into focused yet lively discussion, inquiry, and research. They uncover rather than cover up a subject's controversies, puzzles, and perspectives. Although the teacher may want a unit to culminate in specific understandings, these questions should make clear that other plausible understandings can be derived from such an inquiry.

- *Raise other important questions, often across subject-area boundaries.* Such questions lead to other essential questions as well as to topic-specific questions. For example, the question, In nature, do only the strong survive? leads to questions such as, What do we mean by "strong"? and, Are insects strong because they are

survivors? The question can also lead to inquiries into human biology and physiology.

■ *Address the philosophical or conceptual foundations of a discipline.* They can be found in the most historically important issues, debates, and problems in a field of study. An example is, Is history inevitably biased?

■ *Recur naturally.* The same important questions are asked and re-asked throughout one's learning and in a field's history. For example, What makes a great book great? can be productively examined by 1st graders as well as college students.

■ *Are framed to provoke and sustain student interest.* Focusing units on questions works bes: when the questions are designed to be thought provoking and capable of engaging students in sustained inquiries. Such questions often involve the counterintuitive, the visceral, the whimsical, the controversial, and the provocative. Here are some examples: Is the Internet dangerous for kids? and, Does food that is good for you have to taste bad?

Essential questions have proven to be an effective way of framing a program of study. Indeed, some schools and districts have grounded their curriculum in essential questions. For example, Central Park East Secondary School in New York, founded by Deborah Meier, centers its entire curriculum around a set of broad questions linked to key "habits of mind":

> In every class and every subject, students will learn to ask and to answer these questions:
>
> a. From whose viewpoint are we seeing or reading or hearing? From what angle or perspective?
>
> b. How do we know when we know? What's the evidence, and how reliable is it?
>
> c. How are things, events, or people connected to each other? What is the cause and what is the effect? How do they fit together?
>
> d. What's new and what's old? Have we run across this idea before?
>
> e. So what? Why does it matter? What does it all mean?
>
> (Courtesy of Central Park East Secondary School.)

If designers ponder such questions, they may see how to make their unit design more in-depth and coherent. From a teaching perspective, essential questions are used to focus and deepen the work of a unit by causing rethinking and further inquiry.

We find it helpful to distinguish between two types of essential questions for framing a unit: *overarching* and *topical*. As the phrase implies, overarching questions transcend the particulars of a unit and point toward larger, transferable ideas. Topical questions are more specific. They lead to particular understandings related to the topics of *this* unit, the key inferences and generalizations teachers want students to uncover. Topical questions may not necessarily be easy to answer, but they are answerable using the facts and materials of the unit.

Examples of topical and overarching questions are provided in Figure 6.1. Though in practice, no firm boundaries exist between topical and overarching questions, some differences can be noted.

Overarching

■ *Point beyond a unit to larger, transferable ideas.* These questions point beyond the particulars of a unit to big ideas and enduring understandings. When such questions are framed, the unit's specific topics, events, or texts are typically not mentioned. For example, Is science fiction great literature? is an overarching essential question for a unit on a specific text, such as *Stranger in a Strange Land* or *2001: A Space Odyssey*.

■ *Link a topic to other related topics and subjects.* Overarching essential questions link the particulars and the unique aspects of a topic to issues and inquiries in related topics or other subjects. If used to focus all coursework and curriculum design, they can provide a coherence and set of priorities often lacking in courses of studies. For example, the overarching question, How true does a story need to be to make it compelling and memorable? not only informs a unit on literature but can also be fruitfully addressed by the entire English department and the history department.

Topical

Can be answered by uncovering a unit's content. Topical questions stay within the bounds of a topic. They can be answered as a result of in-depth inquiry (uncovering) into a single topic. Nevertheless, they should be open-ended and thought provoking. They have no *single*, correct answer, but rather several plausible answers that are defensible from the facts of a unit.

MISCONCEPTION ALERT

To say that "coursework derives from questions" might be misunderstood, however, because all teachers ask questions. We mean here the development of content out of *itself*, through questions that inform a unit's worth of work by design, not by day-to-day teacher interrogation of student answers. Anchoring a unit in questions in this sense is different from using prompting or leading questions to check for factual knowledge, move toward the right answer, or sharpen students' responses. To design around questions means to choose activities, instructional strategies, sequences, and materials that make learning seem like the pursuit of questions instead of the taking in of unproblematic truth. Too often, students leave school never realizing that knowledge is answers to someone's prior questions, produced and refined in response to inquiry, testing, argument, and revision. Too often, content standards are defined in intellectually sterile and misleading ways, as if instruction were mere didactic teaching of truth instead of entry into the challenges, arguments, and performances at the heart of each subject discipline. To teach from questions means helping students understand that their job is to question knowledge, not merely take it in. It means rhetorically asking, If knowledge is made up of answers, then what were the questions that gave rise to textbook, teacher, and even professional answers? And what questions can I come up with about that knowledge?

Both overarching and topical questions focus the teaching and learning of big ideas and core processes. We place both kinds of essential questions in Box B of the unit template.

Tips for Using Unit Questions

- Organize programs, courses, units of study, and lessons around essential questions; make all content seem to be the answers to design questions.
- Select or design assessment tasks upfront and make sure they are explicitly linked to the questions. The tasks and performance standards should clarify what acceptable pursuit of, and answers to, the questions actually look like.
- Use a reasonable number of essential questions per unit (two to five). Make less be more: Prioritize content for students to make the work clearly focus on a few key questions.
- Edit the questions to make them as engaging and provocative as possible for a particular age group. Frame the questions in "kid language" as needed.

■ Ensure that every child understands the questions and sees their value. Conduct a survey or informal check if necessary.

■ Derive and design specific exploratory activities and inquiries for each question, as well as make sure that each final assessment either explicitly or implicitly requires a student to answer the question.

■ Sequence the questions so they naturally lead from one to another.

■ Post the essential questions in classrooms, and encourage students to organize notebooks around them to clarify their importance for study and note taking.

■ Help students personalize the questions. Encourage them to share examples, personal stories, and hunches, and to bring in clippings and artifacts to help make the questions come alive.

■ Allow sufficient time for "unpacking" the questions—examining subquestions and probing implications—mindful of student age, experience, and other instructional obligations. Use question-concept maps to show the relatedness of questions.

■ Share your questions with other faculty members. To promote using essential questions schoolwide, ask teachers to post their questions in the faculty room and in department meeting and planning areas. Publish essential questions in the faculty bulletin and discuss them at faculty meetings.

Three worksheets are provided in this module to support designers in building units around essential questions. Use Worksheet 6.1 to brainstorm possible essential questions for your unit. Worksheet 6.2 offers frames for brainstorming overarching and topical essential questions; two figures illustrate how the worksheet was used for a unit on insects (Figure 6.2) and for one on nutrition (Figure 6.3). Worksheet 6.3 uses the six facets of understanding as a stimulus for generating essential questions. Examples of this worksheet are shown for a Civil War unit and for a nutrition unit (Figures 6.4 and 6.5, respectively).

Keep in mind that these worksheets are design tools and should be used to assist curriculum designers. Resist the urge to fill in all the blanks!

REFLECTION FROM BOB JAMES

This idea of using essential questions to frame the curriculum has really gotten me thinking. I'm especially intrigued by this notion. If the textbook contains the answers, then what are the questions? As I reflect on my own education, I can't recall ever being in a course in which the content was framed around important, thought-provoking questions. Some of my teachers and professors asked thought-provoking questions during class, but these essential questions are different. I see how they might provide a focus for my teaching and student inquiry. I now feel a bit cheated, because I'm beginning to realize the power of these overarching questions for pointing to the bigger ideas within a subject or topic.

Well, I suppose a basic question for the unit should be, What is healthful eating? It gets at the essence of what I want my students to take away—the enduring understanding. We could focus on whether students truly understand what is good for them.

To see if I was on the right track, I brought up my ideas over lunch with a few teachers in the faculty room, and they really got into it! We had an interesting discussion about my question, which led to others. If left on their own, will children eat what they need nutritionally? Do tastes change as we grow up—in the direction of healthier eating? If so, why? What about others in the animal kingdom, then? Do young animals naturally eat what is good for them? What is the influence of junk food advertising on the eating patterns of children and adults? Unfortunately, we were really cooking when the 20-minute lunch period ended and I had to leave for recess duty. I think I'll stew on this awhile.

FIGURE 6.1

STAGE 1

Essential Questions: Overarching and Topical

Backward Design Process

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ▹ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ▹ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction

Essential Questions

Overarching	Topical
Art In what ways does art reflect and shape culture? How do artists choose tools, techniques, and materials to express their ideas?	*Unit on masks* What role have masks played in various cultures? What do masks and their use reveal about a culture? What tools, techniques, and materials are used in creating masks from different cultures?
Literature What makes a great story? How do effective writers hook and hold their readers?	*Unit on mysteries* What is unique about the mystery genre? How do great mystery writers hook and hold their readers?
History/Government How do governments balance the rights of individuals with the common good? How and why does the United States provide checks and balances on government power?	*Unit on the U.S. Constitution* In what ways does the Constitution attempt to limit abuse of government powers? Does the separation of powers between the three branches of government create a deadlock?
Science How does an organism's structure enable it to survive in harsh or changing environments? How do organisms survive in harsh or changing environments?	*Unit on insects* How does the structure and behavior of insects enable them to survive? How do insects survive when their environment changes?
Economics How does something acquire value? What changes the worth of something?	*Unit on money and introductory economics* Why do we need money? How is the value of a baseball card determined?
Geography How does the topography, climate, and natural resources of a region influence how people live and work? Why is _____ located there?	*Unit on any state or region* How does the topography, climate, and natural resources of Maryland's Eastern Shore influence the lifestyle and work of its inhabitants? Why is Annapolis, the state capital, located where it is?
Mathematics If axioms are like the rules of a game, when should we change the rules?	*Unit on the parallel postulate* Why is this an axiom if it's so complex? What no longer holds true if we deny it?

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FIGURE 6.2

Corresponds to WS 6.2

STAGE 1

Brainstorming Overarching and Topical Questions

Insects Unit

Backward Design Process		
Stage 1: Identify Desired Results A ▸ Enduring Understandings B ▸ Essential Questions C ▸ Knowledge and Skills	**Stage 2: Determine Acceptable Evidence** D ▸ Performance Tasks ➢ Performance Task Blueprint (D) E ▸ Quizzes, Tests, Prompts F ▸ Unprompted Evidence G ▸ Self-Assessment ➢ Blueprint for Other Evidence (E, F, G)	**Stage 3: Plan Learning Experiences and Instruction** H ▸ Sequence of Learning Experiences and Instruction

Given the targeted understandings or content standards for your unit, brainstorm possible overarching and topical essential questions to stimulate inquiry and guide the unit.

Unit on insects

Overarching Questions

How does an organism's structure and behavior patterns enable it to survive in its environment?

In nature, do only the strong survive?

Topical Questions

How does the structure of insects enable them to survive?

Will insects outlive the human race?

How do insects adapt to changing conditions in their environment?

How do insects use natural resources to help them survive?

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FIGURE 6.3

Corresponds to WS 6.2

STAGE 1

BRAINSTORMING OVERARCHING AND TOPICAL QUESTIONS

Nutrition Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings	D ▸ Performance Tasks	H ▸ Sequence of Learning Experiences and Instruction
B ▸ Essential Questions	➤ Performance Task Blueprint (D)	
C ▸ Knowledge and Skills	E ▸ Quizzes, Tests, Prompts	
	F ▸ Unprompted Evidence	
	G ▸ Self-Assessment	
	➤ Blueprint for Other Evidence (E, F, G)	

Given the targeted understandings or content standards for your unit, brainstorm possible overarching and topical essential questions to stimulate inquiry and guide the unit.

Unit on nutrition

Overarching Questions

What is healthful living?
What is wellness?

Why does the United States have so many health problems that are caused by unhealthy lifestyles, despite the available information?

Topical Questions

What is healthful eating?

What is meant by a balanced diet?

Could a healthy diet for one individual be unhealthy for another?

How might we encourage people to eat the way they know they should?

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FIGURE 6.4

Corresponds to WS 6.3

STAGE 1

Generating Essential Questions Using the Facets

Civil War Unit

Backward Design Process

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ▸ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ▸ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction

Use the "lenses" of the six facets of understanding to generate possible essential questions for a topic or content standard.

Explanation
?
Was the Civil War avoidable?
Interpretation
?
What does *The Red Badge of Courage* reveal about human beings and war?
Application
?
How should the United States memorialize the war to best honor its legacy (i.e., the war's memory and influence)?
CIVIL WAR
How might it feel if your home and land were destroyed by people in your country?
Empathy
?
What do you believe is worth fighting for?
Self-Knowledge
?
How did the war look from the point of view of
• Native Americans?
• The British?
• Other: _____
Perspective
?

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FIGURE 6.5

Corresponds to WS 6.3

STAGE 1

GENERATING ESSENTIAL QUESTIONS USING THE FACETS

Nutrition Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction

Use the "lenses" of the six facets of understanding to generate possible essential questions for a topic or content standard.

Explanation
?
What is meant by a balanced diet?
Interpretation
?
What does the popularity of fast foods say about modern life in the United States?
Application
?
What could we serve as healthy yet tasty snacks for a class party?
NUTRITION
How might it feel to live with a dietary restriction caused by a medical condition?
Empathy
?
Do the food pyramid guidelines apply in other regions, such as the Middle East, Asia, and Antarctica?
Perspective
?
To what extent are you a healthy eater?
Self-Knowledge
?

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WORKSHEET 6.1

STAGE 1

BRAINSTORMING ESSENTIAL QUESTIONS

BACKWARD DESIGN PROCESS		
Stage 1: Identify Desired Results **A ▸** Enduring Understandings **B ▸** Essential Questions **C ▸** Knowledge and Skills	**Stage 2: Determine Acceptable Evidence** **D ▸** Performance Tasks ➤ Performance Task Blueprint (D) **E ▸** Quizzes, Tests, Prompts **F ▸** Unprompted Evidence **G ▸** Self-Assessment ➤ Blueprint for Other Evidence (E, F, G)	**Stage 3: Plan Learning Experiences and Instruction** **H ▸** Sequence of Learning Experiences and Instruction

Essential questions are used to focus and deepen a unit's work by causing rethinking and further inquiry. Consider the following characteristics as you brainstorm possible essential questions for your unit or course.

Essential questions

- Have no one obvious right answer.
- Raise other important questions, often across subject-area boundaries.
- Address the philosophical or conceptual foundations of a discipline.
- Recur naturally.
- Are framed to provoke and sustain student interest.

Possible Essential Questions

-
-
-
-
-
-
-
-
-

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WORKSHEET 6.2

Corresponds to Figs. 6.2, 6.3

STAGE 1

BRAINSTORMING OVERARCHING AND TOPICAL QUESTIONS

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

Given the targeted understandings or content standards for your unit, brainstorm possible overarching and topical essential questions to stimulate inquiry and guide the unit.

Unit on

Overarching Questions

Topical Questions

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WORKSHEET 6.3

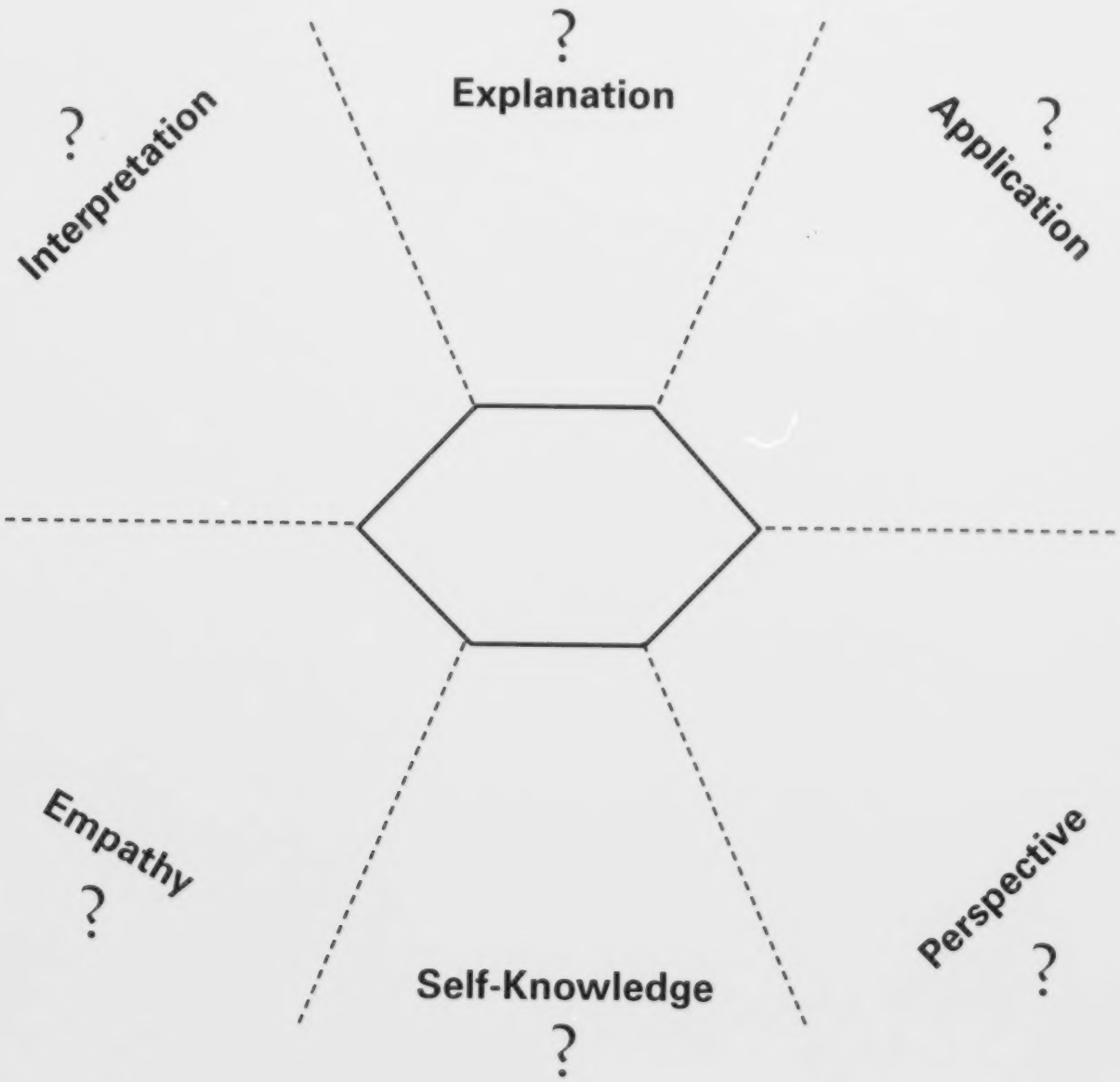
Corresponds to Figs. 6.4, 6.5

STAGE 1

Generating Essential Questions Using the Facets

Backward Design Process		
Stage 1: Identify Desired Results	**Stage 2: Determine Acceptable Evidence**	**Stage 3: Plan Learning Experiences and Instruction**
A ▸ Enduring Understandings	**D** ▸ Performance Tasks	**H** ▸ Sequence of Learning Experiences and Instruction
B ▸ Essential Questions	➤ Performance Task Blueprint (D)	
C ▸ Knowledge and Skills	**E** ▸ Quizzes, Tests, Prompts	
	F ▸ Unprompted Evidence	
	G ▸ Self-Assessment	
	➤ Blueprint for Other Evidence (E, F, G)	

Use the "lenses" of the six facets of understanding to generate possible essential questions for a topic or content standard.



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The UNDERSTANDING by DESIGN Handbook

STAGE 2

DETERMINE ACCEPTABLE EVIDENCE

Modules 7–11

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ◗ Enduring Understandings	**D** ◗ Performance Tasks	**H** ◗ Sequence of Learning Experiences and Instruction
B ◗ Essential Questions	➤ Performance Task Blueprint (D)	
C ◗ Knowledge and Skills	**E** ◗ Quizzes, Tests, Prompts	
	F ◗ Unprompted Evidence	
	G ◗ Self-Assessment	
	➤ Blueprint for Other Evidence (E, F, G)	

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MODULE 7

EVIDENCE OF UNDERSTANDING

Thinking like an assessor boils down to two basic questions. Where should we look to find hallmarks of understanding, and What should we look for *in determining and distinguishing degrees of understanding? The first question asks us to consider the necessary evidence—the* kinds of performance or behavior *indicative of understanding; the second question asks us to focus on the most salient and revealing criteria for identifying and* differentiating *levels or degrees of understanding—using criteria and rubrics to sort work by quality along a continuum (emphasis in original).*

—WIGGINS & MCTIGHE, 1998, PP. 67–68

USING THE MODULE

What is evidence of in-depth understanding, as opposed to superficial or naive understanding? Where should we look, and what should we look for to determine the extent of student understanding? What kinds of assessment evidence will anchor our curricular units and thus guide our instruction? These are an assessor's questions.

Worksheet 3.3

Too often, as teachers, we rely on only one or two types of assessment, then compound that error by concentrating on those aspects of the curriculum that are most easily tested by multiple-choice or short-answer items. And frequently we fail to consider the differences between tests and other forms of assessment that are particularly well suited for gathering evidence of understanding or its absence.

In fact, a great error in aiming for understanding is to assume that formal testing is the main vehicle of gathering evidence. On the contrary, as the phrase "check for understanding" implies, ongoing formative and informal assessment is vital if students are to achieve understanding and avoid misunderstanding.

To think like an assessor before designing lessons—what backward design demands—does not come naturally or easily to many teachers. We are far more used to thinking like an activity designer once we have a target: We easily and unconsciously jump from Stage 1 to Stage 3 of the backward design process, from

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content standards to the design of lessons, without asking ourselves, Will we have the evidence we need to assess for the desired knowledge and skill?

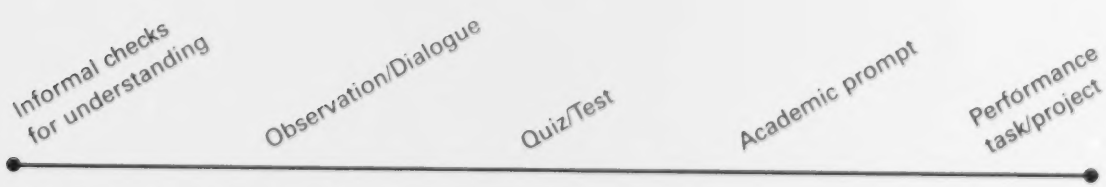
Backward design demands that we short-circuit this natural instinct. Otherwise, the design is likely to be less coherent and less focused on understanding—and successful results will be obtained more by chance than by design.

When planning to collect evidence of understanding, teachers should consider a range of assessment methods, shown in Figure 7.1. This continuum includes checks of understanding (such as oral questions, observations, dialogues, student logs, self-assessments, and peer assessments); traditional quizzes, tests, and open-ended prompts; and performance tasks and projects. They vary in scope (from simple to complex), time frame (from short-term to long-term), setting (from de-contextualized to authentic contexts), and structure (from highly to ill-structured). Because understanding develops as a result of ongoing inquiry and rethinking, the assessment of understanding should be thought of as a collection of evidence over time instead of an event—a single moment-in-time test at the end of instruction—as so often happens in current practice.

In effective assessments, we see a match between the type or format of the assessment and the achievement target it intends to measure. If the goal is for students to learn basic concepts and skills, then written tests and quizzes generally provide adequate and efficient measures. When the goal, however, is deep understanding, we need to rely on more complex assessment methods to determine if the goal has been reached. Figure 7.2 shows the relationship between types of assessments and different curriculum targets.

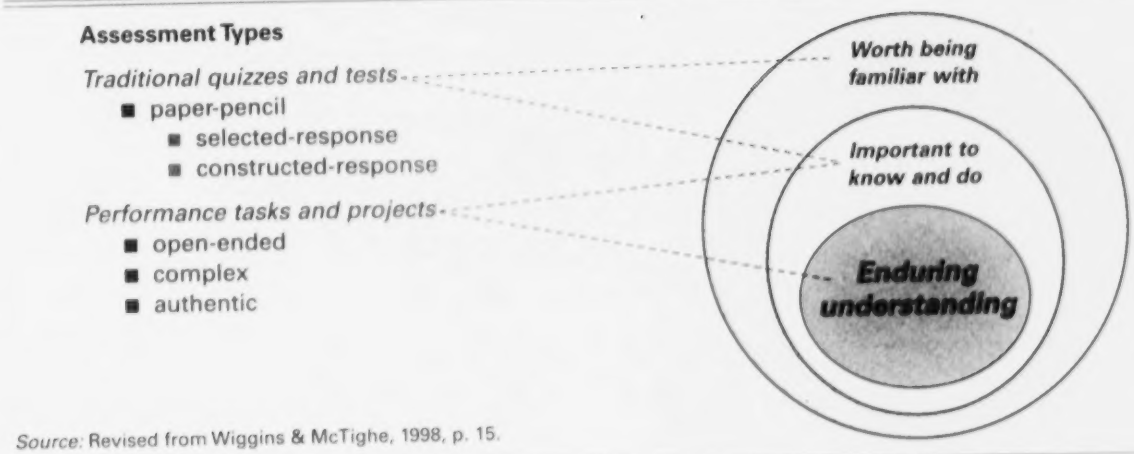
Given the focus on enduring understanding, our unit or course will be anchored by performance tasks or projects. This type of assessment provides evidence that

FIGURE 7.1 CONTINUUM OF ASSESSMENT METHODS



Source: Wiggins & McTighe, 1998, p. 12.

FIGURE 7.2 CURRICULAR PRIORITIES AND ASSESSMENT METHODS



Source: Revised from Wiggins & McTighe, 1998, p. 15.

students are able to use their knowledge in context, a more appropriate means of evoking and assessing enduring understanding. More traditional assessments, such as quizzes, tests, and prompts, are used to round out the picture by assessing essential knowledge and skills that contribute to the culminating performances.

Quiz and Test Items

This type of assessment consists of simple, content-focused questions that

- Assess for factual information, concepts, and discrete skills.
- Use selected-response or short-answer formats.
- Are convergent—typically have a single, best answer.
- May easily be scored using an answer key (or machine scoring).
- Are secure (not known in advance).

Academic Prompts

Academic prompts are open-ended questions or problems that require students to think critically, not just recall knowledge, and to prepare a response, product, or performance. Such questions or problems

- Require constructed responses under school exam conditions.
- Are open, with no single best answer or solution strategy.

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- Are often ill-structured, requiring the development of a strategy.
- Involve analysis, synthesis, evaluation, or a combination of the three.
- Require an explanation or defense of an answer and methods used.
- Require judgment-based scoring, using criteria and performance standards.
- May or may not be secure.

Performance Tasks and Projects

This type of assessment involves complex challenges that mirror the issues and problems adults face. The challenges are authentic. Ranging in length from short-term tasks to long-term, multistaged projects, they require a tangible product or performance. They differ from academic prompts in that they

- Use real or simulated settings with the kinds of constraints, background noise, incentives, and opportunities an adult would find in a similar situation.
- Require students to address an identified audience.
- Are based on a specific purpose that relates to the audience.
- Allow students greater opportunity to personalize the task.
- Are not secure. The task, criteria, and standards are known in advance and guide student work.

We summarize the key elements of a performance task in the acronym GRASPS: goal, role, audience, situation, product or performance, and standards.

■ ■ ■ ■ ■

Worksheet 7.1 helps ensure that teachers consider the full range of evidence that can be used for assessing complex understandings. Figure 7.3 shows examples of evidence used for a literature unit.

■ When we speak of evidence of understanding, we are referring to evidence gathered through a variety of formal and informal assessments during a unit of study or a course. We are not alluding only to end-of-teaching tests or culminating performance tasks. Rather, the collected evidence we seek may well include observations and dialogues, traditional quizzes and tests, performance tasks and projects, as well as students' self-assessments gathered over time.

MISCONCEPTION ALERT

■ A common misconception among teachers is that understanding can be assumed if students do well on the tests the teachers construct. Indeed, one might call it THE teacher misconception about evidence of understanding. "If I said it clearly and they answer correctly, then they must have understood it." We have heard the joke about the teacher who says, "I taught it, but they didn't learn." Too few teachers critically ask, What is convincing evidence of understanding? How do I know students aren't just giving back what was taught without understanding it? What evidence would show for certain if they have real or apparent understanding?

The oversight is worsened by the all-too-common assumption that if the assessment task is hands-on, then the results are valid. Many so-called assessment tasks are just interesting activities that can be done with or without deep understanding. And many inauthentic paper-pencil tasks (e.g., essay prompts) provide solid evidence on whether or not students understood key ideas. Understanding backward design requires realizing not merely *that* assessment design comes before instruction and clarity of target precedes assessment design but *why*. Validity demands such a logic. And sound assessment of complex targets invariably demands multiple sources of evidence and types of performance, irrespective of assessment politics and preferences.

REFLECTION FROM BOB JAMES

In addition to the quizzes that I have always given, I now need to think about what would actually serve as evidence of the understandings I'm after. After reviewing examples of performance assessments and discussing ideas with my colleagues, I have decided on the following performance task:

> Because we have been learning about nutrition, the camp director at the Outdoor Education Center has asked us to propose a nutritionally balanced menu for our three-day trip to the center later this year. Using the USDA food pyramid

guidelines and the nutrition facts on food labels, design a plan for three days, including the three meals and three snacks (morning, afternoon, and campfire time). Your goal: a tasty and nutritionally balanced menu. In addition to your menu, prepare a letter to the director explaining how your menu meets the USDA nutritional guidelines. Include a chart showing a breakdown of the fat, protein, carbohydrates, vitamins, minerals, and calories.

This task also links well to one of our unit projects—to analyze a hypothetical family's diet for a week and propose ways to improve their nutrition. With this task and project in mind, I can now use quizzes to check students' prerequisite knowledge of the food groups and the food pyramid recommendations, and a test to check their understanding of how a nutritionally deficient diet contributes to health problems. This is the most complete assessment package I've ever designed for a unit, and I think that the task will motivate students as well as provide evidence of their understanding.

FIGURE 7.3

Corresponds to WS 7.1

STAGE 2

CONSIDERING A RANGE OF EVIDENCE

Literature Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction

Write the targeted understanding and core performance task in the middle box—what students should understand and be able to do. Then, brainstorm types of evidence that might be most useful, insightful, and fair for rounding out the picture to produce sufficient evidence of understanding.

Formal observations or interviews of students

Seminar discussion on author's choice of narrator.

Public performances

Turn a fairy tale into a poem or news article.

Targeted Understanding

Understand that the relationship between form and content in literature often illuminates key ideas.

Written, oral, or visual (displayed) products in response to prompts

As editors, students review a text for possible plagiarism. The text duplicates the style of a well-known writer (e.g., e. e. cummings).

Core Performance Task

Videotape a simulated Siskel and Ebert review of a book turned into a movie (e.g., Romeo and Juliet).

Student self-assessments, logs, and peer reviews

Reading logs, with student comments on the author's craft.

Student exhibits or models

A Web site exhibit on different treatments of the same themes in different books (e.g., courage and the horrors of war).

Short-answer quizzes and tests

Quiz on the readings about author's point of view and literary style.

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WORKSHEET 7.1

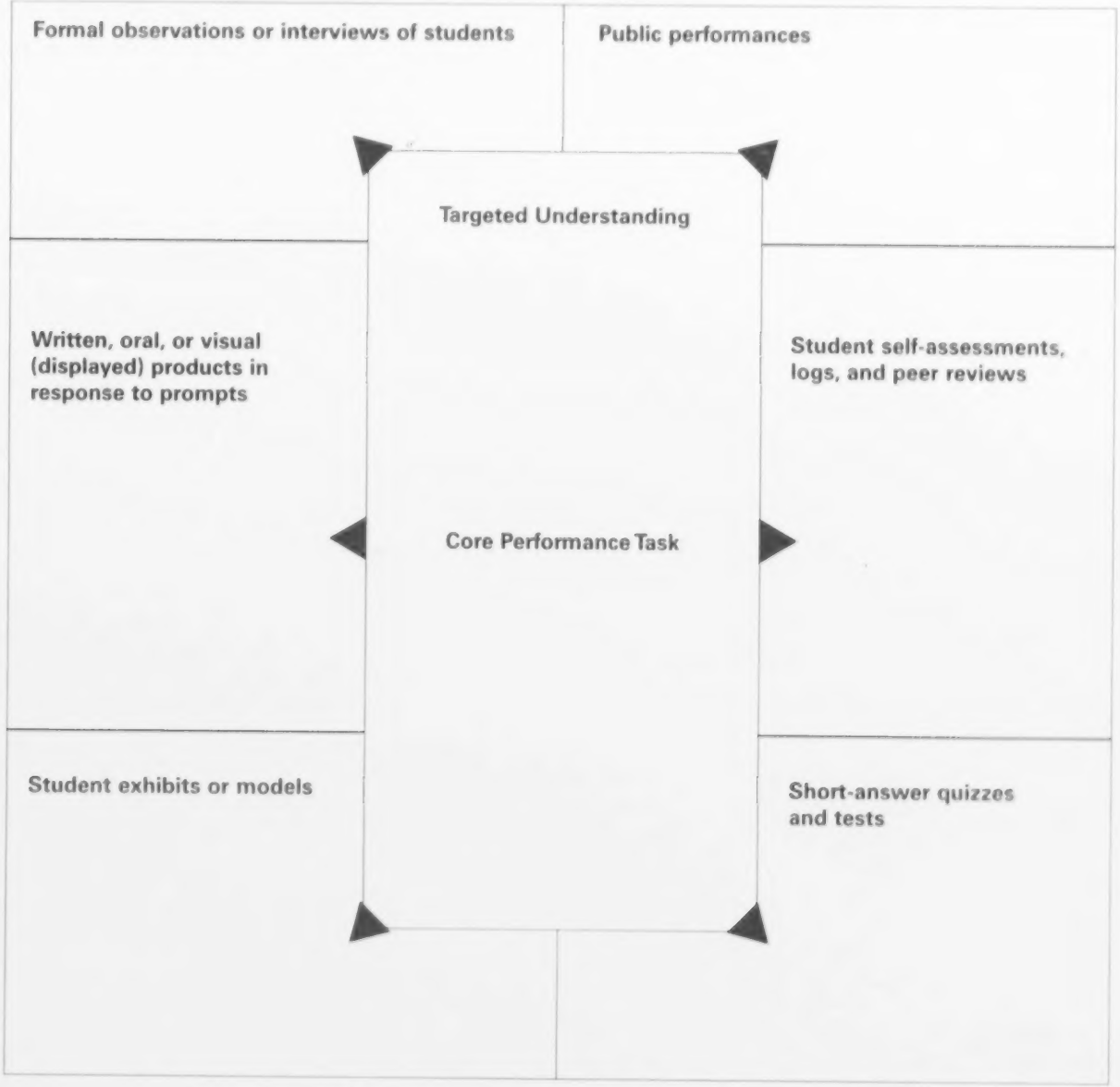
Corresponds to Fig. 7.3

STAGE 2

CONSIDERING A RANGE OF EVIDENCE

BACKWARD DESIGN PROCESS		
Stage 1: Identify Desired Results A ▸ Enduring Understandings B ▸ Essential Questions C ▸ Knowledge and Skills	**Stage 2: Determine Acceptable Evidence** D ▸ Performance Tasks ➢ Performance Task Blueprint (D) E ▸ Quizzes, Tests, Prompts F ▸ Unprompted Evidence G ▸ Self-Assessment ➢ Blueprint for Other Evidence (E, F, G)	**Stage 3: Plan Learning Experiences and Instruction** H ▸ Sequence of Learning Experiences and Instruction

Write the targeted understanding and core performance task in the middle box—what students should understand and be able to do. Then, brainstorm types of evidence that might be most useful, insightful, and fair for rounding out the picture to produce sufficient evidence of understanding.


Formal observations or interviews of students
Public performances
Targeted Understanding
Written, oral, or visual (displayed) products in response to prompts
Student self-assessments, logs, and peer reviews
Core Performance Task
Student exhibits or models
Short-answer quizzes and tests

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MODULE

8

Transforming Understandings into Performances

Understanding is not directly observable or measurable. How then can teachers obtain evidence of student understanding? They need to consider ways in which students might demonstrate their understanding through tangible performances.

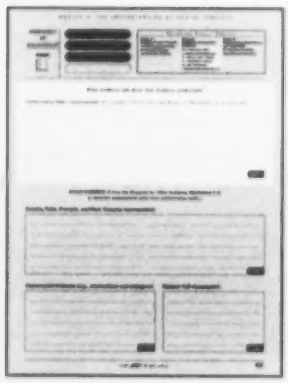
USING THE MODULE

A practical means of generating ideas for performance assessments of understanding involves combining the generalizations to be understood with appropriate verbs. The verbs specify the *kinds* of performances needed to reveal understanding by making the invisible, visible.

Figure 8.1 provides an example of how to turn a targeted understanding (generalization) into possible performances. Designers can use Worksheet 8.1 to transform understandings into possible performances for their own unit.

Performance-oriented verbs are embedded within the six facets of understanding and Bloom's (1956) higher-order thinking. A list of possible performance verbs, based on the six facets, is shown in Figure 8.2. Think of these verbs as answering the questions, What are appropriate performances for best revealing particular understandings? and, What must a student do to provide evidence of understanding?

Worksheet 3.3



D *Performance Tasks*

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MISCONCEPTION ALERT

■ Simply connecting a performance verb with a topic or content standard is inadequate. The statement, Students should understand how to compare and contrast characters when reading literature, tells little about the particular insights to be gained from such analysis. Teachers first need to identify a specific understanding and frame it as a generalization. Next, they should consider which facet or facets of understanding would appropriately reveal the targeted understanding. The verbs under the facets can then be used to generate ideas for possible understanding performances.

■ A related misconception refers to framing targets as generalizations. We realize that many teachers state their objectives in the form of "understand how to" (e.g., Students will understand how to solve quadratic problems), but such phrasing does not address the particular insights or results to be shown. The understanding that teachers seek to observe is derived from the performance but is not synonymous with it. The performance reveals whether or not students understand the idea in question; the performance is not the idea. Thus, designers are asked to first frame the target as generalizations (Stage 1), then specify the assessments (Stage 2). Another way to think of the first two stages is to use this syntax: I want my students to understand that [*x is the case*], and they can best reveal their understanding by showing they understand how to [*perform y and z*]. Framing the understanding and performance this way avoids two problems: treating something as an understanding that is really a skill; and confusing the performance with the understanding.

REFLECTION FROM BOB JAMES

The facets and performance verbs have been helpful as I think about possible ways that students could demonstrate their understanding through performance. For example, the verb *design* under the application facet gave me the idea of having the students design a brochure to introduce younger students to the principles of healthy eating. I plan to keep this verb list in my plan book for easy reference.

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FIGURE 8.1

STAGE 2

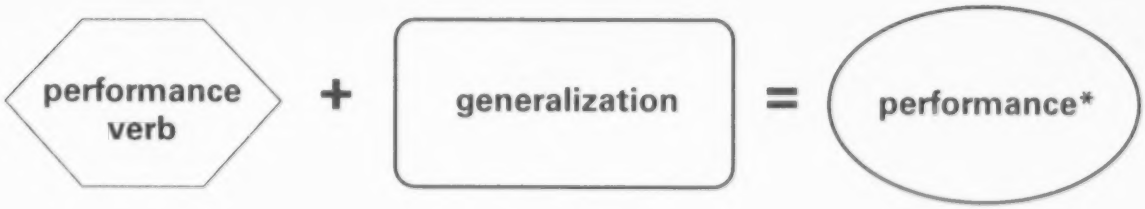
TRANSFORMING TARGETED UNDERSTANDINGS INTO POSSIBLE PERFORMANCES

History Unit on the 1960s

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings B ▸ Essential Questions C ▸ Knowledge and Skills	D ▸ Performance Tasks ➢ Performance Task Blueprint (D) E ▸ Quizzes, Tests, Prompts F ▸ Unprompted Evidence G ▸ Self-Assessment ➢ Blueprint for Other Evidence (E, F, G)	H ▸ Sequence of Learning Experiences and Instruction

Turn a targeted understanding into possible performances that can be assessed.



Possible performances for *a history unit on the 1960s*

- **Explain how** U.S. involvement in the Vietnam War caused some people to lose faith in their government.
- **Argue for or against** the view that the antiwar movement was sparked by the Civil Rights movement.
- **Apply** your understanding of the era in a role-play re-creation of the Kerner Commission report on violence.

* *Note:* Performance here can refer to an authentic performance task and an academic prompt.

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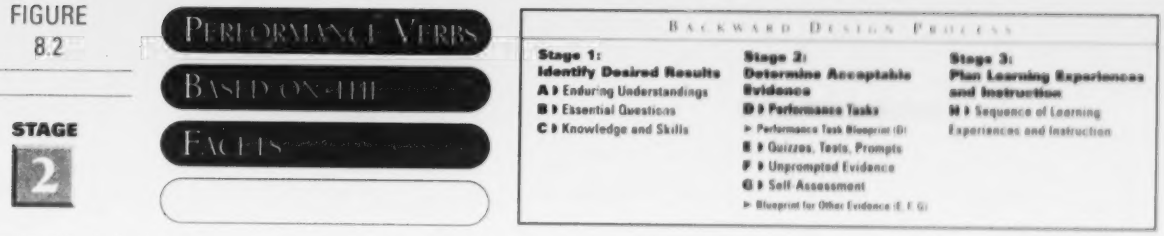
FIGURE 8.2



STAGE 2

Consider the following performance verbs when planning specific tasks and prompts through which students can demonstrate their understanding. (See Worksheet 8.1.)

Explanation	Interpretation	Application	Perspective	Empathy	Self-Knowledge
demonstrate	create analogies	adapt	analyze	assume role of	be aware of
derive	critique	build	argue	be like	realize
describe	document	create	compare	be open to	recognize
design	evaluate	de-bug	contrast	believe	reflect
exhibit	illustrate	decide	criticize	consider	self-assess
express	judge	design	infer	imagine	
induce	make sense of	exhibit		relate	
instruct	make meaning of	invent		role-play	
justify	provide metaphors	perform			
model		produce			
predict	read between the lines	propose			
prove		solve			
show	represent	test			
synthesize	tell a story of	use			
teach	translate				

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WORKSHEET 8.1

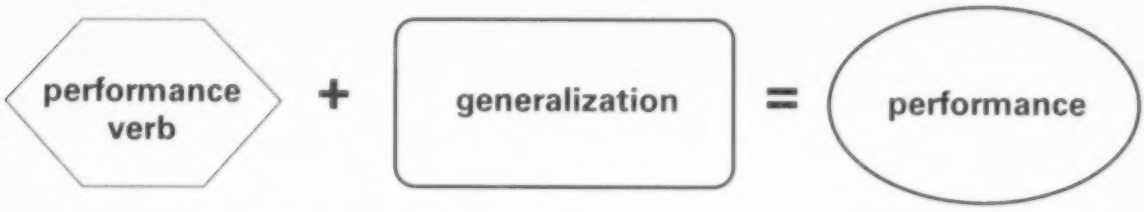
STAGE 2

Transforming Targeted Understandings into Possible Performances

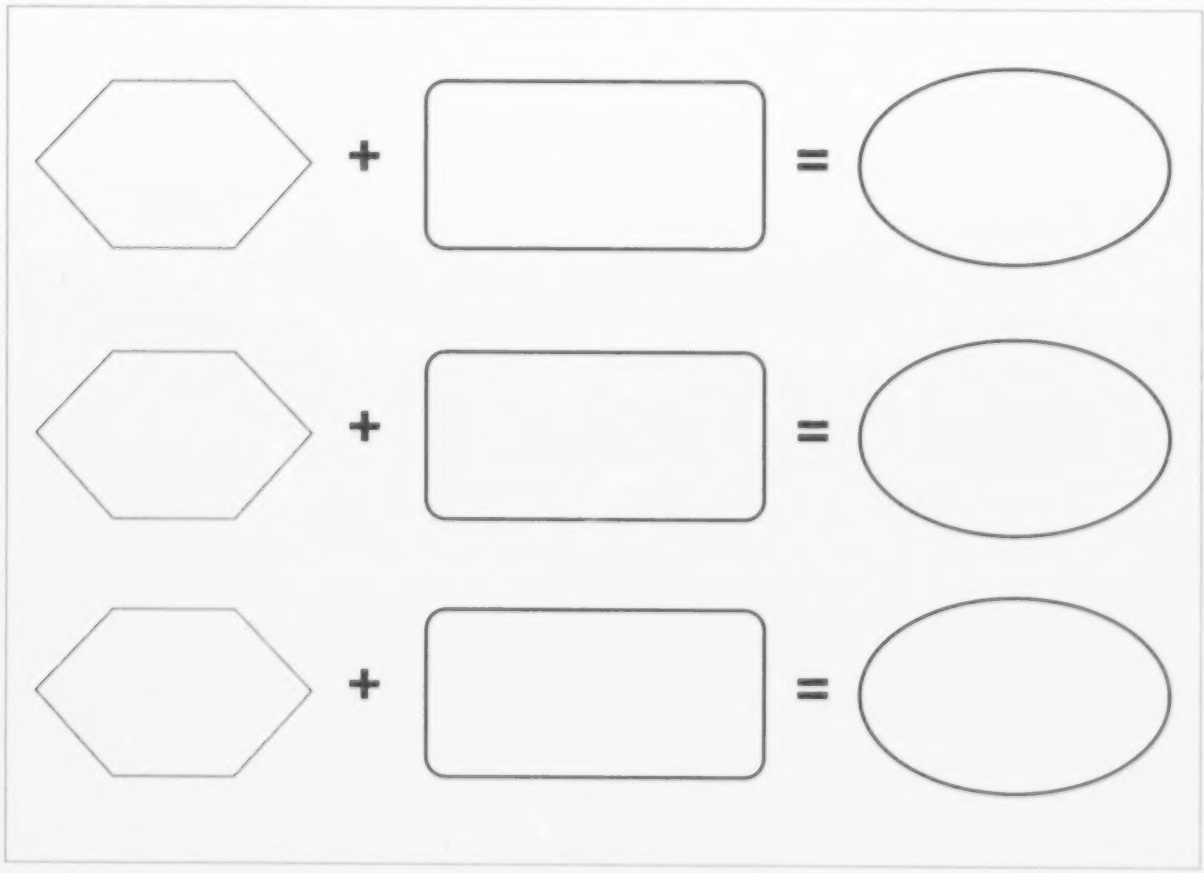
Backward Design Process

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings	**D** ▸ **Performance Tasks**	**H** ▸ Sequence of Learning Experiences and Instruction
B ▸ Essential Questions	➤ Performance Task Blueprint (D)	
C ▸ Knowledge and Skills	**E** ▸ Quizzes, Tests, Prompts	
	F ▸ Unprompted Evidence	
	G ▸ Self-Assessment	
	➤ Blueprint for Other Evidence (E, F, G)	

Turn a targeted understanding into possible performances that can be assessed.



Possible performances for



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MODULE 9

DESIGNING PERFORMANCE TASKS

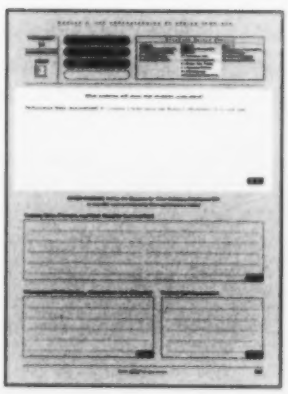
Given the focus on understanding, a unit or course should be anchored by performance tasks. They provide evidence that students are able to use knowledge in context (i.e., understand what they know).

USING THE MODULE

Understanding is about more than technical knowledge and skill. It requires good judgment in the use of knowledge—know-how, in other words. Understanding is revealed through diverse performances, in differing contexts. Thus, assessment for understanding must be grounded in performance-based tasks and projects that are as authentic as possible. To test primarily for discrete facts and skills makes little sense, because such testing implies that understanding can be demonstrated by merely plugging in responses to decontextualized questions. This type of assessment would be like evaluating court judges solely on their memory of legal cases or doctors on their recall of biochemistry and pathology facts.

Conventional test questions, whether from national tests or the teacher down the hall, neither replicate nor simulate the kinds of challenges adults face in the workplace, community, or home. We are not condemning these types of questions, but rather characterizing them. In the language of psychometrics, they are indirect ways of testing performance. Whether for reasons of cost, time, feasibility, or purpose, such test items serve as proxies for real performance. Although discrete test items have a use, in the same way that drills have a place in coaching, the sum of the items is not understanding.

Worksheet 3.3



D *Performance Tasks*

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Authentic Tasks

Authentic tasks have certain characteristics. An assessment task, problem, or project is authentic if it

- *Is realistic.* The task replicates or simulates the ways a person's knowledge and abilities are tested in the real world.
- *Requires judgment and innovation.* A student has to use knowledge and skills wisely and effectively to solve unstructured problems. A plan must be designed, and the solution must involve more than following a set routine or procedure, or plugging in knowledge.
- *Asks a student to "do" the subject.* Instead of reciting, restating, or replicating through demonstration what was taught or already known, the student has to carry out exploration and work in a subject.
- *Replicates or simulates the contexts in which adults are tested in the workplace, community, and home.* Authentic contexts involve specific situations that have particular constraints, purposes, and audiences. Typical school tests are context-less. Students need to experience what it is like to do tasks in the workplace and other real-life contexts, which tend to be messy and murky. Authentic tasks undo the arbitrary secrecy, silence, and absence of apt resources and feedback that mark school tests.
- *Assesses a student's ability to efficiently and effectively use a repertoire of knowledge and skills to negotiate a complex task.* Most conventional test items are isolated elements of performance—similar to sideline drills in athletics. Although a place for drill tests exists, performance is always more than the sum of the drills.
- *Allows appropriate opportunities to rehearse, practice, and consult resources; obtain feedback on performances; and refine performances and products.* Conventional, secure tests that keep questions and resource materials secret from students before test time must coexist with assessment against known tasks if students are to improve performance; if teachers are to focus student learning through cycles of perform-feedback-revision-perform to produce specified high-quality products; and if teachers are to help students learn to use information, resources, and notes to effectively perform in authentic contexts.

A call for greater authenticity in tests is neither new nor inappropriate for a world of standards. Bloom (1956) and his colleagues realized the importance of

such work 40 years ago, as shown, for example, in their description of application and of tests to assess synthesis:

> [Application uses] situations new to the student or situations containing new elements as compared to the situation in which the abstraction was learned. Ideally, we are seeking a problem which will test the extent to which an individual has learned to apply the abstraction in a practical way. . . . [Synthesis is] a type of divergent thinking [where] it is unlikely that the right solution to a problem can be set in advance (p. 125).

An assessment approach grounded in authentic work calls for students (and teachers) to learn two important points. First, they must learn how adults in the world beyond school use the knowledge and skills that are being taught and learned. Second, students must learn why individual lessons to develop discrete knowledge and skills are meaningful—how such work leads to mastery of more complex and interesting performance tasks. Just as a basketball player endures the drudgery of shooting endless foul shots or a flutist the monotony of playing scales—hoping that their efforts will pay off in high-quality performance—so, too, must students come to see, to experience, that testing and teaching will pay off in better performance.

Performance Task Vignettes

The vignettes in this section offer brief descriptions of student performance tasks that may be used to assess student understanding. Notice how the tasks reflect the characteristics described earlier in the chapter. Information in parentheses under the title lists the subject area and grades where the task can be used.

From the Mountains to the Seashore

(History, geography; grades 6–8)

A group of nine foreign students is visiting your school for one month as part of an international exchange program. (Don't worry, they speak English!) The principal has asked your class to plan and budget a four-day tour of Virginia to help the visitors understand the state's impact on the history and development of the United States. Plan your tour so that visitors are shown sites that best capture Virginia's influence on U.S. development.

Write an itinerary that includes an explanation of why each site was selected. Include a map tracing the tour's route and a budget.

Garden Design

(Mathematics; grades 6–8)

For a company, plan a flower garden that reflects the company's logo of side-by-side circular, rectangular, and triangular shapes. The product should be a labeled scale drawing and a list showing how many plants of each type and color will be needed.

Hall of Recognition

(Social studies, language arts; grades 4–5)

Your state has announced the establishment of a Hall of Recognition to honor the contributions of its citizens to their community, the state, or the United States. Because you are learning about famous individuals from your state, you have been asked to nominate a candidate whom you believe would be worthy of admission to the Hall.

Select and research the life of one individual from the state. Submit a nomination letter to the Hall's selection committee explaining the reasons your candidate should be included in the Hall of Recognition. Be sure to describe your nominee's accomplishments and contributions.

Literary Hall of Fame

(English; grades 10–12)

The state Council of Arts and Letters has announced the establishment of a Hall of Fame to honor the works of notable U.S. authors and artists. Because your class is finishing a course on U.S. literature, you have been asked to nominate an author for admission to the Hall of Fame.

Complete the nomination form for an author you believe is worthy of induction into the Hall. Attach an essay containing your analysis of the author's contribution to U.S. literature and your rationale for recommending inclusion in the Hall of Fame.

Mail-Order Friend

(Language arts; grades K–2)

Imagine that you have an opportunity to "order" a friend by telephone from a mail-order catalog. Think about the qualities that you want in a friend. Before you order your friend, practice asking for three characteristics that you want in a friend, and give an example of each characteristic. Remember to speak clearly and loudly enough so that the sales person will know exactly what to send.

Moving Van Go

(Writing, mathematics; grades 6–9)

You work for a moving company that plans to submit a bid for moving the contents of an office building to a new location. Determine the minimum volume of furniture and equipment that must be moved. The exemplary product should take into account (1) stackability of the items; (2) interlocking nature of noncubical pieces; (3) padding to protect the furniture; and (4) number and size of the boxes needed to pack the small items.

Prepare a written report specifying the volume of items to be moved, your rationale for the findings, and a chart showing how the items will be placed to minimize the volume needed.

Mythic Job Search

(English; grades 7–10)

Select an epic hero from the literature you have read, and write him a business letter applying for a job as a crew member on his expeditions. Specify the position you want, your qualifications for the job, and the reasons you think you would be an asset to the crew. Be sure to make your letter persuasive, emphasizing that you understand the particular struggles and adventures the hero and crew have already undertaken, and explaining your value to them in handling such situations and difficulties. Include a resume.

Installing Sheet Rock

(Mathematics; grades 8–10)

Don't you hate to be ripped off? We all do, but sometimes it's hard to tell. When contractors give us an estimate on home repairs, how can we know if the cost is reasonable?

You are given room dimensions and cost figures for materials and labor. Determine if a sheet-rocking contractor is giving accurate information or trying to overcharge you.

True Concessions

(Mathematics/pre-algebra; grades 7–8)

Using data from the previous two years, decide on an amount of food to order for this year's concession stand at the local football stadium. Make a list of food and amounts, accompanied by a written justification.

We're Talking History

(Language arts, social studies; grades 5–12)

Interview adults on their recollections of the Vietnam era, and write a history of that time. In a separate essay, affirm or correct the adults' oral history using research from secondary and original sources about that time frame.

■ ■ ■ ■ ■

How does one come up with authentic and engaging tasks? We have found that designers of performance tasks benefit from using design tools as they work. In this module, we have included a collection of practical and proven performance task design tools to assist you in completing the Performance Task Blueprint page of the Understanding by Design template (Worksheet 3.4).

Worksheet 9.1 presents a set of prompts to create an authentic scenario for a performance task. Figure 9.1 is an example of how some of the prompts are used in high school mathematics. Figures 9.2–9.5 offer more specific ideas for performance tasks components. Figure 9.2 lists possible student goals, and Worksheet 9.2 provides space for adding goals for a specific unit. Figure 9.3 shows possible student roles; Figure 9.4, audiences; and Figure 9.5, products and performances. Worksheet 9.3 provides a planning matrix for a task scenario.

Additional ideas for designing performance tasks are based upon the six facets of understanding (see Figure 9.6). Worksheets 9.4 and 9.5 present idea starters for each facet. Figures 9.7 and 9.8 show how some of these ideas are used in a graduate-level course on educational assessment.

MISCONCEPTION ALERT

Thinking like an assessor prior to designing lessons—what backward design demands—does not come naturally or easily to many teachers, who are accustomed to thinking like an activity designer first. Consider a summary of the differences, shown in the table below. The first set of questions in the table ensures that the eventual activities and instructional strategies derive from and point toward the appropriate final assessments. The second set of questions, though logical from the perspective of activity design, makes it far less likely that the work will culminate in understanding or that teachers will have the evidence needed to judge whether such understanding has occurred.

The following true story suggests the extent of the problem:

> A 7th grade teacher captures the energy and imagination of his students by announcing that they will have to eat the results of their next science experiment. But what is engaging is not always what is most effective or appropriate, given the time available. Making peanut brittle offers little in the way of big ideas and enduring understanding for the two weeks allotted.

Thinking like an Assessor	Thinking like an Activity Designer
What would be sufficient and revealing evidence of understanding?	What would be interesting and engaging activities on this topic?
What performance tasks must anchor the unit and focus the instructional work?	What resources and materials are available on this topic?
How will I be able to distinguish between those who really understand and those who don't (though they may seem to)?	What will students be doing in and out of class? What assignments will be given?
Against what criteria will I distinguish work?	How will I give students a grade (and justify it to their parents)?
What misunderstandings are likely? How will I check for those?	Did the activities work? Why or why not?

Source: Wiggins & McTighe, 1998, p. 68.

REFLECTION FROM BOB JAMES

The Understanding by Design performance task design tools are excellent. I particularly liked Worksheet 9.1 (Prompts for Constructing a Performance Task Scenario) because it provides a framework for considering the components of an authentic task: goal, role, audience, situation, product or performance, and standards for success. I also liked Worksheet 3.4 (Performance Task Blueprint) for summarizing the task. The blueprint is a useful format for sharing performance tasks with other teachers.

A colleague found it helpful to consider the question, How do adults in the larger world use the knowledge and skills we're teaching? Working through the figures and worksheets and having a brief brainstorming session with another 5th grade teacher has led me to the following idea for a culminating performance task:

> Because we have been learning about nutrition, the camp director at the Outdoor Education Center has asked us to propose a nutritionally balanced menu for our three-day trip to the center later this year. Using the USDA food pyramid guidelines and the nutrition facts on food labels, design a plan for three days, including the three meals and three snacks (morning, afternoon, and campfire time). Your goal: a tasty and nutritionally balanced menu. In addition to your menu, prepare a letter to the director explaining how your menu meets the USDA nutritional guidelines. Include a chart showing a breakdown of the fat, protein, carbohydrates, vitamins, minerals, and calories.

I'm excited about this task because it asks students to demonstrate one of the targeted understandings of the unit: how to plan healthy menus for themselves and others. This task also links well with an earlier activity: analyze a hypothetical family's diet for a week and propose ways to improve their nutrition. Each student will prepare a camp menu, unlike the diet analysis, which was done in groups. This final assessment will enable me to see the extent to which each student can apply an understanding of balanced diets and healthy eating.

FIGURE 9.1

STAGE 2

CONSTRUCTING A PERFORMANCE TASK SCENARIO

Mathematics Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
➢ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

Goal

- The goal is to minimize costs for shipping bulk quantities of M&Ms.

Role

- You are an engineer in the packaging department of Mars, Inc., makers of M&Ms.

Audience

- The target audience is nonengineer company executives.

Situation

- The context you find yourself in is to convince the company officers that your container design will provide cost-effective use of the given materials, maximize shipping volume of bulk quantities of M&Ms, and be safe to transport.

Product or Performance

- You need to design a shipping container from given materials so that M&Ms can be shipped safely and cost-effectively. Then you will prepare a written proposal in which you include a diagram and show mathematically how your container design provides efficient and effective use of the given materials and maximizes the shipping volume of the M&Ms.

Standards for Success

- Your product must meet the following standards:
  - Use the given materials cost-effectively.
  - Maximize shipping volume of bulk quantities of M&Ms.
  - Be safe to transport.

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FIGURE 9.2

STAGE 2

Possible Goals for Performance Tasks

Backward Design Process		
Stage 1: Identify Desired Results	**Stage 2: Determine Acceptable Evidence**	**Stage 3: Plan Learning Experiences and Instruction**
A ▸ Enduring Understandings	**D** ▸ Performance Tasks	**H** ▸ Sequence of Learning Experiences and Instruction
B ▸ Essential Questions	➤ Performance Task Blueprint (D)	
C ▸ Knowledge and Skills	**E** ▸ Quizzes, Tests, Prompts	
	F ▸ Unprompted Evidence	
	G ▸ Self-Assessment	
	➤ Blueprint for Other Evidence (E, F, G)	

- Summarize the procedure for a lab experiment for a student who was absent.
- Explain the legal justification for a court decision to newspaper readers.
- Inform the PTA Garden Committee about which plants are best suited to your area.
- Teach a younger student about the water cycle. (declarative)
- Teach a classmate to read a contour map. (procedural)
- Design a poster to teach classmates about human, capital, and natural resources.
- Create a museum display to document a historical event you've researched.
- Persuade a friend to read a book by your favorite author.
- Defend your position with data.
- Critique a student's letter to the editor of the local newspaper.
- Identify errors or weaknesses in mathematical reasoning of a fellow student.
- Correct errors in a student's essay on persuasiveness.
- Improve your first draft of a research report.

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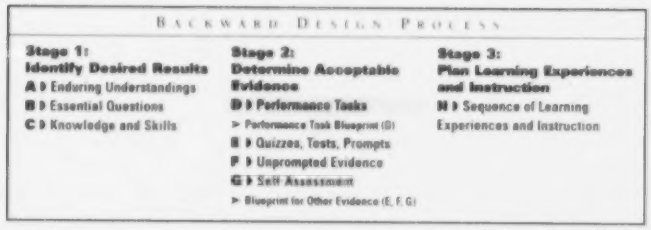
FIGURE 9.3

STAGE 2

POSSIBLE STUDENT ROLES FOR PERFORMANCE TASKS


BACKWARD DESIGN PROCESS
Stage 1:
Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills
Stage 2:
Determine Acceptable Evidence
D ▸ Performance Tasks
➢ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➢ Blueprint for Other Evidence (E, F, G)
Stage 3:
Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

advertiser
artist or illustrator
author
biographer
Boy Scout or Girl Scout
candidate
cartoon character
caterer
chairperson
chef
coach
composer
detective
editor
elected official
engineer
expert in _____
eyewitness
filmmaker
firefighter
historian
intern
interviewer
inventor
lawyer
literary critic
museum director or curator
newscaster
novelist
nutritionist
panelist
park ranger
photographer
pilot
playwright
poet
police officer
product designer
reporter
researcher
scientist
ship's captain
social scientist
taxi driver
teacher
tour guide
travel agent
TV or movie character
tutor
zoo keeper
other: _____

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FIGURE 9.4

STAGE 2

POSSIBLE AUDIENCES FOR PERFORMANCE TASKS

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings B ▸ Essential Questions C ▸ Knowledge and Skills	D ▸ Performance Tasks ➢ Performance Task Blueprint (D) E ▸ Quizzes, Tests, Prompts F ▸ Unprompted Evidence G ▸ Self-Assessment ➢ Blueprint for Other Evidence (E, F, G)	H ▸ Sequence of Learning Experiences and Instruction

advertisers
board members (school, community, or foundation)
boss
businesses or corporations (local, regional, or national)
celebrities
community members or helpers
customers or consumers
experts (individual or panel)
foreign embassy staff
friends
government or elected officials (local, state, or federal)
historical figures
judge
jury
library patrons
museum visitors
neighbors
relatives
pen pals
radio listeners
readers (newspaper or magazine)
school staff
students (any age)
travel agent
travelers
TV viewers
visitors (to school, community, state, or country)
other: _____

_____

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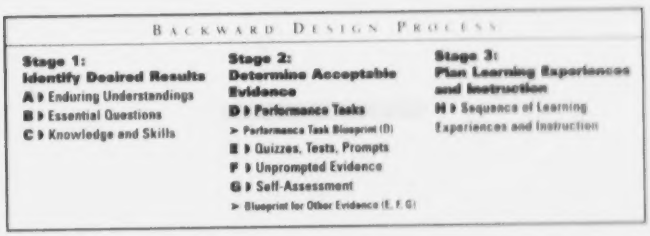
FIGURE 9.5

STAGE 2

POSSIBLE PRODUCTS AND PERFORMANCES


BACKWARD DESIGN PROCESS
Stage 1:
Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills
Stage 2:
Determine Acceptable Evidence
D ▸ Performance Tasks
➢ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➢ Blueprint for Other Evidence (E, F, G)
Stage 3:
Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

What student products and performances will provide appropriate evidence of understanding and proficiency? The following table offers possibilities. (Remember that student products and performances should be framed by an explicit purpose or goal and an identified audience.)

Written	Oral	Visual (displayed)
advertisement	audiotape	advertisement
biography	debate	banner
book report or review	discussion	cartoon
brochure	dramatization	collage
crossword puzzle	interview	collection
editorial	newscast	computer graphic
essay	play	constructed item
experiment record	poetry reading	data display
game	presentation	design
journal	rap	diagram
lab report	report	diorama
letter	skit	display
log	song	drawing
magazine article	speech	filmstrip
memo	teach a lesson	graph
newspaper article	other: _____	map
poem	_____	model
position paper		painting
proposal		photograph
questionnaire		poster
research report		scrapbook
script		sculpture
story		slide show
test		storyboard
other: _____		videotape
_____		other: _____
		_____

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FIGURE 9.6

STAGE 2

PERFORMANCE ASSESSMENT IDEAS BASED ON THE FACETS

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ▸ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ▸ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction

THE SIX FACETS OF UNDERSTANDING

Explanation	Interpretation	Application	Perspective	Empathy	Self-Knowledge
Show and say how electric lights work.	Report on the meaning of *Animal Farm*.	Design a bridge to withstand specific forces and wave patterns.	Compare British and French textbooks accounts of the Revolutionary War to your textbook account.	Take on a persona from the Titanic, and create a journal, set of letters, or scrapbook.	Keep a log of your reactions to literature and what your reactions reveal about your views of human nature.
Describe why a rhetorical technique is effective in speech.	Develop an oral history on the significance of the 1960s.	Use the case method in business, medicine, or law.	Read and discuss *The Real Story of the Three Little Pigs* by A. Wolf.	Imagine you are Juliet from *Romeo and Juliet*, and consider your terrible, final act. What are you thinking and feeling?	Self-assess your involvement in class discussions and performances, and explain your patterns of participation.
Construct and write a mathematical proof.	Write newspaper editorials on the meaning of election results.	Role-play supply-and-demand in a business game.	Analyze the assumptions in political advertising.	Role-play a meeting of the minds (e.g., Truman deciding to drop the atomic bomb).	Develop a résumé and a description of your intellectual strengths and weaknesses.
Provide conceptual clarification (e.g., freedom compared to license).	Draft a Supreme Court decision on a First Amendment case.	Make an audiotape of a favorite book for the school library.	Research the impact of welfare-to-work laws on low-income people.	Work in a soup kitchen, and write an essay on the experiences of the homeless after reading Charles Dickens.	Keep a log of the drama class exercises that demand the most from you emotionally.
Reveal subtle and easily overlooked patterns in phenomena or data.	Do a trend analysis of a finite data set.	Design a museum exhibit on the causes and effects of early 20th century immigration.	Write critical reviews of movies based on best-selling books.	Read and discuss premodern or once-discredited scientific writings to find what is of value in the analyses.	Attach a self-assessment of each paper you write to the paper as you turn it in.
Clarify the causes of global warming.	Represent fear and hope in a dance.	Develop a statistical analysis of crime trends to predict police staff needs in 2010.	Conduct thought experiments (e.g.,What would the world be like if I were riding on a beam of light [from Einstein]?).	Read and discuss literature that confronts you with what is alien (e.g., *The Stranger* or *Pigman*).	Reflect on why students often say in class, "I know this sounds stupid, but," before stating an interesting comment.
Link everyday actions and facts to the laws of physics, concentrating on easily misunderstood aspects (e.g., mass compared to weight).	Conduct research using primary sources, and write a historical biography.	Perform a chemical analysis of local stream water to monitor EPA compliance, and present findings.	Self-assess your writing as if you were an editor for a national magazine.	Write a report on why some kids always get picked on and what it feels like to be those kids.	Propose solutions to an ineffective cooperative learning exercise on the basis of what didn't work in your group.

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FIGURE 9.7

Corresponds to WS 9.4

STAGE 2

ASSESSING UNDERSTANDING USING THE FACTS

(Part 1) *Topic: Assessment*

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings B ▸ Essential Questions C ▸ Knowledge and Skills	D ▸ Performance Tasks ▸ Performance Task Blueprint (D) E ▸ Quizzes, Tests, Prompts F ▸ Unprompted Evidence G ▸ Self Assessment ▸ Blueprint for Other Evidence (E, F, G)	H ▸ Sequence of Learning Experiences and Instruction

Use the following prompts to generate ways that students can reveal their understanding of a topic within a unit or course. The goal is to consider ways that understanding can be shown, not to use every prompt in every facet.

Understanding is demonstrated through **explanation, interpretation,** and **application.**

You *really* understand ___assessment___ when you can . . .
(unit or course topic)

Explanation

- Explain/teach *the concept of validity.*
- Give examples of *criterion-referenced assessment.*
- Make connections with _____.
- Offer a sophisticated theory of *the negative effects of an overreliance on one-shot, standardized testing.*
- Describe how _____.
- Justify/support *the need for balanced use of various types of assessment.*
- Prove/verify _____.
- Avoid common misconceptions, such as, *Assessment is what you do after teaching is completed.*

Interpretation

- Interpret *the phenomenon of test anxiety.*
- Make sense of _____.
- Tell a revealing story of *the power of the backward design process.*
- Provide an apt analogy for *beginning with the end in mind.*
- Show the importance or meaning of _____.
- Translate _____.
- Relate _____ to your experience (or the experiences of others).

Application

- In a new situation, apply *a rubric at home with children (e.g., for household chores).*
- Show or demonstrate _____.
- Use in the context of _____.
- Design/invent *a valid performance task that truly engages learners.*
- Overcome a challenge or constraint, such as *lack of consistency among teachers scoring open-ended performance tasks.*

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FIGURE 9.8

Corresponds to WS 9.5

STAGE 2

Assessing Understanding Using the Facets

(Part 2) *Topic: Assessment*

Backward Design Process		
Stage 1: Identify Desired Results A ▸ Enduring Understandings B ▸ Essential Questions C ▸ Knowledge and Skills	**Stage 2: Determine Acceptable Evidence** D ▸ Performance Tasks ➢ Performance Task Blueprint (D) E ▸ Quizzes, Tests, Prompts F ▸ Unprompted Evidence G ▸ Self-Assessment ➢ Blueprint for Other Evidence (E, F, G)	**Stage 3: Plan Learning Experiences and Instruction** H ▸ Sequence of Learning Experiences and Instruction

Use the following prompts to generate ways that students can reveal their understanding of a topic within a unit or course. The goal is to consider ways that understanding can be shown, not to use every prompt in every facet.

Understanding is revealed through **perspective, empathy,** and **self-knowledge.**

You *really* understand assessment (unit or course topic) when you can . . .

Perspective

- Analyze _____.
- See from the point of view of *a student taking a high-stakes exam.*
- Compare and contrast _____.
- Critique _____.
- Critically examine assumptions such as _____.
- Show how *performance assessment* fits in a historical context.
- See the limits of *external, standardized testing for providing valid measures of local standards.*

Empathy

- Walk in the shoes of _____.
- Experience directly and see *the value of identifying criteria before beginning a performance task.*
- Reach a common understanding with _____ concerning _____.
- Entertain the seemingly odd or alien view that *grading is not essential to learning.*

Self Knowledge

- Recognize your prejudice about _____.
- Identify the lens through which you view *the Scholastic Assessment Tests.*
- See how your habits influence how you approach *grading students.*
- Explain how you came to understand *how assessment can serve to improve learning (not just measure it).*
- Realize that even with all you now know, you don't *really* understand _____.

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WORKSHEET 9.1

STAGE 2

Prompts for Constructing a Performance Task Scenario

Backward Design Process

Stage 1: Identify Desired Results
- **A ▸** Enduring Understandings
- **B ▸** Essential Questions
- **C ▸** Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D ▸ Performance Tasks**
  - ➢ Performance Task Blueprint (D)
- **E ▸** Quizzes, Tests, Prompts
- **F ▸** Unprompted Evidence
- **G ▸** Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H ▸** Sequence of Learning Experiences and Instruction

Consider the following stem statements as you construct a scenario for a performance task using GRASPS. (Note: These are idea starters. Resist the urge to fill in all the blanks.)

Goal

- Your task is _____.
- The goal is to _____.
- The problem/challenge is _____.
- The obstacle to overcome is _____.

Role

- You are _____.
- You have been asked to _____.
- Your job is _____.

Audience

- Your client is _____.
- The target audience is _____.
- You need to convince _____.

Situation

- The context you find yourself in is _____.
- The challenge involves dealing with _____.

Product or Performance

- You will create a _____
  to _____.
- You need to develop/design a _____
  so that _____.

Standards for Success

- Your performance needs to _____.
- Your work will be judged by _____.
- Your product must meet the following standards: _____.
- A successful result will _____.

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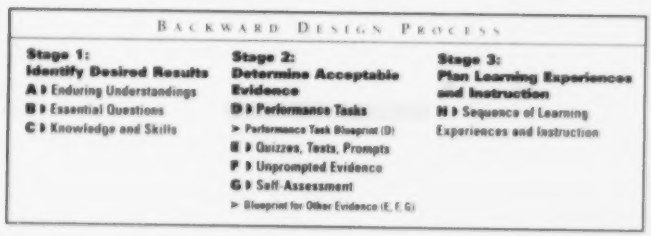
WORKSHEET 9.2

STAGE 2

POSSIBLE GOALS FOR PERFORMANCE TASKS


BACKWARD DESIGN PROCESS
Stage 1:
Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills
Stage 2:
Determine Acceptable Evidence
D ▸ Performance Tasks
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E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➤ Blueprint for Other Evidence (E, F, G)
Stage 3:
Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

Complete the statements for your own units, using the filled-in statements as a guide.

- Summarize _____ for _____.
- Summarize the procedure for a lab experiment for a student who was absent.

- Explain _____ to _____.
- Explain the legal justification for a court decision to newspaper readers.

- Inform _____ about _____.
- Inform the PTA Garden Committee about which plants are best suited to your area.

- Teach _____ about _____.(declarative)
- Teach a younger student about the water cycle. (declarative)
- Teach _____ to _____.(procedural)
- Teach a classmate to read a contour map. (procedural)

- Design a _____ to/for _____.
- Design a poster to teach classmates about human, capital, and natural resources.

- Create a _____ to/for _____.
- Create a museum display to document a historical event you've researched.

- Persuade _____ to _____.
- Persuade a friend to read a book by your favorite author.

- Defend _____ with/to/for _____.
- Defend your position with data.

- Critique _____ to/for _____.
- Critique a student's letter to the editor of the local newspaper.

- Identify errors or weaknesses in _____ of/to/for _____.
- Identify errors or weaknesses in mathematical reasoning of a fellow student.

- Correct errors in _____ to/for/on _____.
- Correct errors in a student's essay on persuasiveness.

- Improve _____ of/to/for _____.
- Improve your first draft of a research report.

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WORKSHEET 9.3

STAGE 2

PLANNING MATRIX FOR A PERFORMANCE TASK SCENARIO

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings B ▸ Essential Questions C ▸ Knowledge and Skills	D ▸ Performance Tasks ▸ Performance Task Blueprint (D) E ▸ Quizzes, Tests, Prompts F ▸ Unprompted Evidence G ▸ Self-Assessment ▸ Blueprint for Other Evidence (E, F, G)	H ▸ Sequence of Learning Experiences and Instruction

Use the following matrix for GRASPS to guide your brainstorming about possible performance task scenarios

Goal	
Role	
Audience	
Situation	
Product or Performance	
Standards	

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WORKSHEET 9.4

Corresponds to Fig. 9.7

STAGE 2

Assessing Understanding: Using the Facets (Part 1)

Backward Design Process		
Stage 1: Identify Desired Results	**Stage 2: Determine Acceptable Evidence**	**Stage 3: Plan Learning Experiences and Instruction**
A ▸ Enduring Understandings	**D** ▸ **Performance Tasks**	**H** ▸ Sequence of Learning Experiences and Instruction
B ▸ Essential Questions	➤ Performance Task Blueprint (D)	
C ▸ Knowledge and Skills	**E** ▸ Quizzes, Tests, Prompts	
	F ▸ Unprompted Evidence	
	G ▸ Self-Assessment	
	➤ Blueprint for Other Evidence (E, F, G)	

Use the following prompts to generate ways that students can reveal their understanding of a topic within a unit or course. The goal is to consider ways that understanding can be shown, not to use every prompt in every facet.

Understanding is demonstrated through **explanation, interpretation,** and **application.**

You *really* understand _____ when you can . . .
(unit or course topic)

Explanation

- Explain/teach _____
- Give examples of _____
- Make connections with _____
- Offer a sophisticated theory of _____
- Describe how _____
- Justify/support _____
- Prove/verify _____
- Avoid common misconceptions, such as _____

Interpretation

- Interpret _____
- Make sense of _____
- Tell a revealing story of _____
- Provide an apt analogy for _____
- Show the importance or meaning of _____
- Translate _____
- Relate _____ to your experience (or the experiences of others).

Application

- In a new situation, apply _____
- Show or demonstrate _____
- Use in the context of _____
- Design/invent _____
- Overcome a challenge or constraint, such as _____

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WORKSHEET 9.5

Corresponds to Fig. 9.8

STAGE 2

ASSESSING UNDERSTANDING USING THE FACETS

(Part 2)

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings	D ▸ Performance Tasks	H ▸ Sequence of Learning Experiences and Instruction
B ▸ Essential Questions	▸ Performance Task Blueprint (D)	
C ▸ Knowledge and Skills	E ▸ Quizzes, Tests, Prompts	
	F ▸ Unprompted Evidence	
	G ▸ Self-Assessment	
	▸ Blueprint for Other Evidence (E, F, G)	

Use the following prompts to generate ways that students can reveal their understanding of a topic within a unit or course. The goal is to consider ways that understanding can be shown, not to use every prompt in every facet.

Understanding is revealed through **perspective, empathy,** and **self-knowledge**.

You *really* understand _____ when you can . . .
(unit or course topic)

Perspective

- Analyze _____.
- See from the point of view of _____.
- Compare and contrast _____.
- Critique _____.
- Critically examine assumptions such as _____.
- Show how _____ fits in a historical context.
- See the limits of _____
  _____.

Empathy

- Walk in the shoes of _____.
- Experience directly and see _____
  _____.
- Reach a common understanding with _____
  concerning _____.
- Entertain the seemingly odd or alien view that _____.

Self Knowledge

- Recognize your prejudice about _____.
- Identify the lens through which you view _____.
- See how your habits influence how you approach _____.
- Explain how you came to understand _____
  _____.
- Realize that even with all you now know, you don't *really* understand _____
  _____.

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MODULE 10

DESIGNING SCORING RUBRICS

Understanding is a matter of degree on a continuum. It is not a matter of right versus wrong but more or less *naive or sophisticated;* more or less *superficial or in-depth. What does a range of explanations look like, for example, from the most naive or simplistic to the most complex and sophisticated? Whatever the response, rubrics provide useful guidance in assessment (emphasis in original).*

—Wiggins & McTighe, 1998, p. 70

USING THE MODULE

A scoring rubric is a tool for evaluating a product or performance. A rubric consists of evaluative criteria, a fixed scale (e.g., four points or six levels), and descriptive terms (indicators) for differentiating among different degrees of understanding, proficiency, or quality. *Rubric* originates from the Latin word, *rubrica*, referring to the use of red earth (later, red ink) to mark something of significance. Today, we maintain the spirit of the term. The criteria in a rubric communicate the important qualities in a product or performance.

Worksheet 3.4

Types of Rubrics

Scoring rubrics can be *holistic*—intended to provide an overall impression of the elements of quality and performance levels in a student's work—or *analytic*—designed to indicate a student's performance level on two or more separate elements of quality (such as a rubric for each criterion).

Rubrics may be *generic* or *task-specific*. A generic rubric provides general criteria for evaluating a student's performance in a given performance area. For example, a generic rubric for persuasive writing may be used with any persuasive writing task. In contrast, a task-specific rubric is designed for use with a *particular* assessment activity (e.g., an open-ended question about a specific reading

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assignment). Although they are useful for task-related feedback, task-specific rubrics cannot be used to evaluate responses to related performance. Thus, they may not allow adequate assessment of a complex and general understanding, because such an assessment would require diverse tasks and evidence.

Rubrics are most effectively used for evaluation or instruction when they are accompanied by examples of responses for each score point. These examples, or anchors, provide tangible illustrations of the various points on the scale. Perhaps the greatest advantage of rubrics lies in their capacity to clearly communicate elements of quality to students and evaluators. The clarity provided by criteria and anchors assists raters in reliably evaluating student responses, products, or performances. The criteria also provide targets toward which teachers can teach and students can aim. When students internalize the criteria contained in rubrics or guides, they are better equipped to engage in self-evaluation and revision of their own work.

Rubrics provide *teachers* with specific criteria for assessing student understanding, a tool for increasing the consistency of evaluation among teachers, and clear targets for instruction. Rubrics provide *students* with clear performance targets, expectations about what is most important, and criteria for evaluating and improving their own work.

Many rubrics only describe a progression of skills from novice to expert. Our quest, however, is not for a rubric of skill development but rather for one that combines insight and performance related to understanding of ideas and meaning. What does a novice understanding of the Cold War look like compared with more expert views? What characterizes an in-depth response? What specifically makes this argument or explanation effective? These are the kinds of questions we as educators need to ask for any specific understanding.

Characteristics of Effective Rubrics

Here are some characteristics of effective rubrics. They

- Are designed to relate specific task requirements to more general performance goals. Ultimately, understanding matters more than performance on a unique task. But the indicators need to be specific enough to enable good feedback and reliable scoring of the particular task.

- Discriminate among different degrees of understanding or proficiency according to significant features, such as thoroughness of explanation or effectiveness of application.
- Do not combine independent criteria in one rubric. For example, to combine "very clear" and "very organized" in the same descriptor often creates a problem, because a paper might be clear but not organized and vice versa.
- Are based on analysis of many specific exemplars or work samples, using the widest possible range. In other words, all potential performances should fit somewhere in a rubric.
- Rely on descriptive language—what quality or its absence looks like—as opposed to relying heavily on mere comparatives or value language (e.g., "not as thorough as" or "excellent product") to make a distinction.
- Avoid making the lowest score points sound bad. The lowest score should rather *describe* what novice or ineffective performance looks like.
- Highlight the judging of the performance's impact—the effect, given the purpose—as opposed to overrewarding just the processes, content used, or good-faith effort. Ultimately, performance is about results. Was the paper persuasive? The problem solved? The story engaging? The speech informative? Teachers should make sure students understand the purpose of the task as reflected in appropriate impact criteria.

■ ■ ■ ■ ■

The figures and worksheets in this module support the design of scoring rubrics to evaluate student understanding. Worksheet 10.1 prompts users to describe differences between novice and expert understanding; Figure 10.1 provides an example of differences for the concept of persuasion within a unit on persuasive writing.

Figures 10.2 and 10.3 each offer a set of generic descriptors to use in rubrics based on the six facets of understanding. Worksheet 10.2 presents a frame to help designers construct a holistic rubric to assess the degree of understanding of a particular generalization or proposition, using a four-point scale. Worksheet 10.3 offers a frame for constructing an analytic rubric to assess the degree of understanding, using a four-point scale.

Figure 10.4 is an example of an analytic rubric containing two criteria: degree of understanding and effectiveness of performance. Notice in this example that understanding is weighted more than effectiveness of performance (60 percent versus 40 percent). Worksheet 10.4 presents an analytic rubric frame based on the six facets. When developing an analytic rubric, designers should use only those facet descriptors that apply to the unit or task.

➤ **MISCONCEPTION ALERT**

■ Validity applies to rubrics, not just to assessment tasks. Suppose that students are given a writing task to see if they understand satire. The rubric for judging this task places exclusive emphasis on spelling and grammatical accuracy. Although the scores would be highly reliable—counting such errors is easy—they are likely to lead to invalid inferences about the students' ability to write satirically with insight and efficacy. Accurate spelling and grammatical usage are certainly elements of effective writing, but their presence does not guarantee engaging, vivid, and coherent satire. In this case, the rubric has not delineated all the key criteria related to the targeted outcome.

Assessment designers must take care to focus on the most appropriate criteria to assess the desired capacities. Have they identified the most important and revealing dimensions of performance, given the criteria most apt for their achievement target? Does the rubric provide an effective way of discriminating among degrees of understanding and proficiency? Are the descriptors for each level of performance sufficiently grounded in actual samples of different quality performances? These and other questions lie at the heart of valid rubric construction.

■ Many rubrics fail to focus on the purpose of the work—the desired impact of the product or performance. Instead, they focus on the content and polish of the work. A paper or proof can be accurate and organized, yet still be unpersuasive; a computation may be accurate, but ineffective at solving a larger problem. In addition to evaluating specific component traits (such as accuracy, organization, and thoroughness), a rubric should highlight the appropriate result or end. If the goal is to build a working roller coaster or argue a debate position, then one needs to specify the traits of the successful roller coaster or winning debate. Creativity is then heightened, not impeded, when impact criteria are included.

■ Perhaps the most common misunderstanding about rubrics is that they can only be developed after a specific task has been designed. A rubric is meant as a

bridge between unique performance tasks and a more general target. The target to be assessed is usually more general than any particular task. For example, a rubric for judging the effectiveness of an essay should be applicable to any essay; thus, it can and should be written before a particular writing prompt is developed. The qualities of an effective essay guide the rubric's development. Designers may add specific indicators to a rubric to make it more task-specific and helpful to students, but they should know the general criteria of performance before designing a unique task.

- Even though the general qualities of an effective performance or product can be identified in advance of the assessment task, to believe that a rubric is finalized prior to using it is a misconception. In fact, a rubric becomes more specific by carefully analyzing a range of student work samples. The specificity of the language in a rubric is derived by describing the distinguishing features of different levels of performances and products, such as exemplary, solid, and subpar. Rubrics based on actual student work provide greater clarity for students as well as teachers because they ground a rubric's somewhat abstract language in tangible examples.
- A common mistake in rubric design and use is to score what is easiest to score, not what is essential. For example, many rubrics give a higher score when students include more footnotes or reasons. In some cases, more is better, but teachers should not lose sight of the product's or performance's purpose—its quality or impact, for example. An essay with one compelling, well-supported reason may be more persuasive than an essay with three weakly developed and supported reasons.

MISCONCEPTION ALERT

(continued)

REFLECTION FROM BOB JAMES

Although I've had some experience using rubrics, I found some valuable ideas in the Understanding by Design materials. The sample descriptive language for the six facets will help me overcome the tendency to create "counting" rubrics; for example, students will get a "3" if their work has three details, a "2" for two details, and so forth.

The suggestion to focus on impact criteria really hits home; most of the rubrics that my colleagues and I use emphasize particular traits, such as

organization, use of details, accuracy, and neatness. The traits don't always address the overall result based on the goal or purpose. I'm going to revise some other rubrics I use with this idea in mind.

I usually fine-tune my rubrics after I've used them, but I've never actually modified a rubric based on a careful look at student work. I can see how this approach could help make the rubric language even more understandable because some of the terms are open to different interpretations.

FIGURE 10.1

Corresponds to WS 10.1

STAGE 2

NAIVE VERSUS SOPHISTICATED UNDERSTANDING

Persuasive Writing Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
- ➢ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
- ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction

How would you develop a simple rubric to assess understanding of a targeted big idea or complex process? What are the indicators of a naive understanding? Of a sophisticated understanding? Pick a specific idea to consider or describe naïvete and sophistication in general.

Targeted big idea *the concept of persuasion within a unit on persuasive writing*

Indicators of Understanding

naïve	sophisticated
The novice persuader ■ Believes that stating a point clearly will result in people being persuaded. ■ Only knows one persuasive technique and uses it for every situation, even when it is ineffective. ■ Does not anticipate the different points of view when preparing a persuasive argument.	The expert persuader ■ Recognizes that different circumstances and audiences require different persuasive approaches or techniques. ■ Is proficient in a variety of persuasive techniques and knows when to apply them. ■ Deliberately considers different perspectives and makes plans to address or counter them when preparing a persuasive argument.

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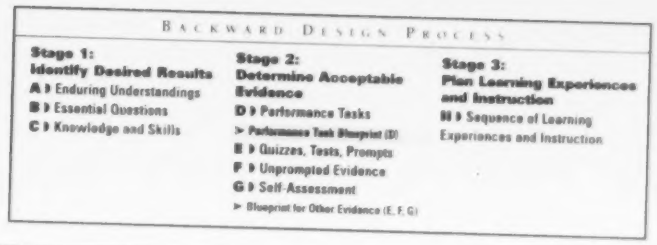
FIGURE 10.2

STAGE 2

Analytic Rubric for Understanding


Backward Design Process
Stage 1:
Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills
Stage 2:
Determine Acceptable Evidence
D ▸ Performance Tasks
➢ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➢ Blueprint for Other Evidence (E, F, G)
Stage 3:
Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

Explanation	Interpretation	Application
Sophisticated: an unusually thorough, elegant, and inventive account (model, theory, or explanation); fully supported, verified, and justified; deep and broad; goes well beyond the information given	*Profound*: a powerful and illuminating interpretation and analysis of the importance/meaning/significance; tells a rich and insightful story; provides a rich history or context; sees deeply and incisively any ironies in the different interpretations	*Masterful*: fluent, flexible, and efficient; able to use knowledge and skill and adjust understandings well in novel, diverse, and difficult contexts
In-depth: an atypical and revealing account, going beyond what is obvious or what was explicitly taught; makes subtle connections; well supported by argument and evidence; novel thinking displayed	*Revealing*: a nuanced interpretation and analysis of the importance/meaning/significance; tells an insightful story; provides a telling history or context; sees subtle differences, levels, and ironies in diverse interpretations	*Skilled*: competent in using knowledge and skill and adapting understandings in a variety of appropriate and demanding contexts
Developed: an account that reflects some in-depth and personalized ideas; the student is making the work her own, going beyond the given—there is supported theory here, but insufficient or inadequate evidence and argument	*Perceptive*: a helpful interpretation or analysis of the importance/meaning/significance; tells a clear and instructive story; provides a useful history or context; sees different levels of interpretation	*Able*: able to perform well with knowledge and skill in a few key contexts, with a limited repertoire, flexibility, or adaptability to diverse contexts
Intuitive: an incomplete account but with apt and insightful ideas; extends and deepens some of what was learned; some "reading between the lines"; account has limited support/argument/data or sweeping generalizations. There is a theory, but one with limited testing and evidence	*Interpreted*: a plausible interpretation or analysis of the importance/meaning/significance; makes sense of a story; provides a history or context	*Apprentice*: relies on a limited repertoire of routines; able to perform well in familiar or simple contexts, with perhaps some needed coaching; limited use of personal judgment and responsiveness to specifics of feedback/situation
Naive: a superficial account; more descriptive than analytical or creative; a fragmentary or sketchy account of facts/ideas or glib generalizations; a black-and-white account; less a theory than an unexamined hunch or borrowed idea	*Literal*: a simplistic or superficial reading; mechanical translation; a decoding with little or no interpretation; no sense of wider importance or significance; a restatement of what was taught or read	*Novice*: can perform only with coaching or relies on highly scripted, singular "plug-in" (algorithmic and mechanical) skills, procedures, or approaches

Source: Wiggins & McTighe, 1998, pp. 76–77.

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Perspective	Empathy	Self-Knowledge
Insightful: a penetrating and novel viewpoint, effectively critiques and encompasses other plausible perspectives; takes a long and dispassionate, critical view of the issues involved.	*Mature:* disposed and able to see and feel what others see and feel; unusually open to and willing to seek out the odd, alien, or different.	*Wise:* deeply aware of the boundaries of one's own and others' understanding, able to recognize one's prejudices and projections, has integrity—able and willing to act on what one understands.
Thorough: a revealing and coordinated critical view; makes own view more plausible by considering the plausibility of other perspectives; makes apt criticisms, discriminations, and qualifications.	*Sensitive:* disposed to see and feel what others see and feel; open to the unfamiliar or different.	*Circumspect:* aware of one's ignorance and that of others; aware of one's prejudices; knows the strengths and limits of one's understanding.
Considered: a reasonably critical and comprehensive look at all points of view in the context of one's own; makes clear that there is plausibility to other points of view.	*Aware:* knows and feels that others see and feel differently; somewhat able to empathize with others; has difficulty making sense of odd or alien views.	*Thoughtful:* generally aware of what is and is not understood; aware of how prejudice and projection can occur without awareness and shape one's views.
Aware: knows of different points of view and somewhat able to place own view in perspective, but weakness in considering worth of each perspective or critiquing each perspective, especially one's own; uncritical about tacit assumptions.	*Developing:* has some capacity and self-discipline to "walk in another's shoes," but is still primarily limited to one's own reactions and attitudes; puzzled or put off by different feelings or attitudes.	*Unreflective:* generally unaware of one's specific ignorance; generally unaware of how subjective prejudgments color understandings.
Uncritical: unaware of differing points of view; prone to overlook or ignore other perspectives; has difficulty imagining other ways of seeing things; prone to egocentric argument and personal criticisms.	*Egocentric:* has little or no empathy beyond intellectual awareness of others; sees things through own ideas and feelings, ignores or is threatened or puzzled by different feelings, attitudes, or views.	*Innocent:* completely unaware of the bounds of one's understanding and of the role of projection and prejudice in opinions and attempts to understand.

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FIGURE 10.3

STAGE 2

DESCRIPTORS FOR AN UNDERSTANDING RUBRIC

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
- ➢ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
- ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

Facet 1 Explanation	Facet 2 Interpretation	Facet 3 Application	Facet 4 Perspective	Facet 5 Empathy	Facet 6 Self-Knowledge
Accurate	Meaningful	Effective	Credible	Sensitive	Self-aware
Coherent	Important	Efficient	Revealing	Open	Metacognitive
Justified	Significant	Fluent	Insightful	Receptive	Self-adjusting
Systematic	Illustrative	Practical	Plausible	Perceptive	Reflective
Predictive	Illuminating	Graceful	Unusual	Tactful	Wise

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Generalization or proposition: _____

Performance or product: _____

Scale	CRITERIA (Weight)	
	Understanding (60%)	**Performance** (40%)
4	Shows a sophisticated understanding of the relevant ideas or processes. The concepts, evidence, arguments, qualifications made, questions posed, and methods used are advanced, going well beyond the grasp of the subject typically found at this age level.	The performance or product is highly effective. The ideas are presented in an engaging, polished, clear, and thorough manner, and are mindful of the audience, context, and purpose. The final product or performance shows high-quality craftsmanship.
3	Shows a solid understanding of the relevant ideas or processes. The concepts, evidence, arguments, and methods used are appropriate for addressing the issues or problems. Response shows no misunderstandings of key ideas or overly simplistic approaches.	The performance or product is effective. The ideas are presented in a clear and thorough manner, showing awareness of the audience, context, and purpose.
2	Shows a somewhat naïve or limited understanding of the relevant ideas or processes. The concepts, evidence, arguments, and methods used are somewhat simple, crude, or inadequate for addressing the issues or problems. Response may reveal some misunderstandings of key ideas or methods.	The performance or product is somewhat effective. Some problems with clarity, thoroughness, delivery, and polish are evident. It is unclear whether the audience, context, and purpose have been considered.
1	Shows little apparent understanding of the relevant ideas or processes. The concepts, evidence, arguments, and methods used are inadequate for addressing the issues or problems. Response reveals major misunderstandings of key ideas or methods.	The performance or product is ineffective. One of two situations is evident: The performance is unpolished, providing little evidence of planning, practice, and consideration of purpose and audience; or the presentation is so unclear and confusing that the key points are difficult to determine.

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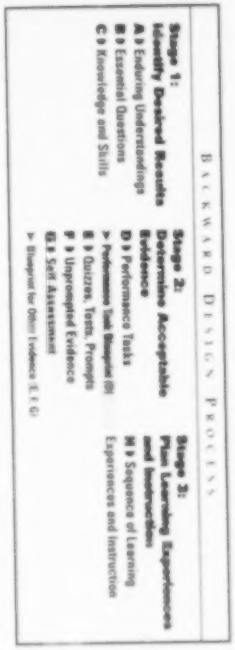
FIGURE 10.4

STAGE 2

AN ANALYTIC RUBRIC WITH TWO CRITERIA


BACKWARD DESIGN PROCESS
Stage 1: Identify Desired Results
A ▷ Enduring Understandings
B ▷ Essential Questions
C ▷ Knowledge and Skills
Stage 2: Determine Acceptable Evidence
D ▷ Performance Tasks
E ▷ Quizzes, Tests, Prompts
F ▷ Unprompted Evidence
G ▷ Self-Assessment
Stage 3: Plan Learning Experiences and Instruction
H ▷ Sequence of Learning Experiences and Instruction

WORKSHEET 10.1

Corresponds to Fig. 10.1

STAGE 2

NAIVE VERSUS SOPHISTICATED UNDERSTANDING

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
➢ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

How would you develop a simple rubric to assess understanding of a targeted big idea or complex process? What are the indicators of a naive understanding? Of a sophisticated understanding? Pick a specific idea to consider or describe naivete and sophistication in general.

Targeted big idea

Indicators of Understanding

naive	sophisticated
■	■
■	■
■	■
■	■
■	■
■	■
■	■
■	■
■	■

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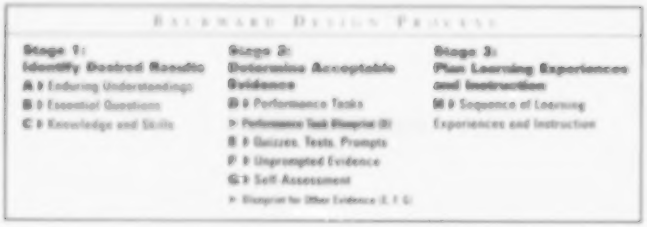
WORKSHEET 10.2

STAGE 2

A Holistic Rubric Frame


Backward Design Process
Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills
Stage 2: Determine Acceptable Evidence
PT ▸ Performance Tasks
▸ Performance Task Blueprint (PT)
OE ▸ Quizzes, Tests, Prompts
IP ▸ Unprompted Evidence
SA ▸ Self-Assessment
▸ Blueprint for Other Evidence (OE, IP, SA)
Stage 3: Plan Learning Experiences and Instruction
WHERETO ▸ Sequence of Learning Experiences and Instruction

Use the space below to further develop a 4-point rubric to evaluate the degree to which students understand a generalization or proposition. Add specific descriptors to the general descriptors below. You may revise the general descriptors if appropriate. (Refer to the language in Figures 10.2 and 10.3 for possible descriptive terms.)

Generalization or proposition

Scale	Criteria and Indicators
4	Shows a sophisticated understanding of the relevant ideas or processes. The concepts, evidence, arguments, qualifications made, questions posed, and methods used are advanced, going well beyond the grasp of the subject typically found at this age level. ■ ■
3	Shows a solid understanding of the relevant ideas or processes. The concepts, evidence, arguments, and methods used are appropriate for addressing the issues or problems. Response shows no misunderstandings of key ideas or overly simplistic approaches. ■ ■
2	Shows a somewhat naïve or limited understanding of the relevant ideas or processes. The concepts, evidence, arguments, and methods used are somewhat simple, crude, or inadequate for addressing the issues or problems. Response may reveal some misunderstandings of key ideas or methods. ■ ■
1	Shows little apparent understanding of the relevant ideas or processes. The concepts, evidence, arguments, and methods used are inadequate for addressing the issues or problems. Response reveals major misunderstandings of key ideas or methods. ■ ■

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WORKSHEET 10.3

STAGE 2

An Analytic Rubric Frame

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
▸ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
▸ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

Use the frame below to identify criteria for evaluating student understanding and effectiveness of a performance or product.

Generalization or proposition: _____

Performance or product: _____

CRITERIA (Weight)	Scale	4	3	2	1
	( )				
	( )				
	( )				
	( )				

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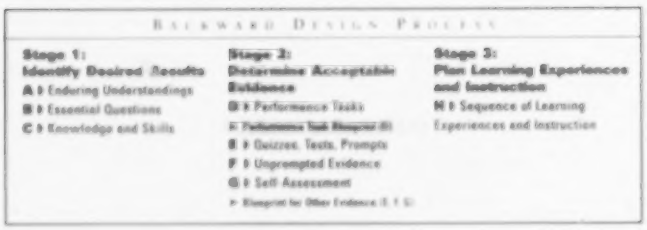
WORKSHEET 10.4

STAGE 2

An Analytic Rubric Frame for the Facets


Backward Design Process
Stage 1:
Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills
Stage 2:
Determine Acceptable Evidence
D ▸ Performance Tasks
E ▸ Performance Task Blueprint (D)
F ▸ Unprompted Evidence
G ▸ Self-Assessment
▸ Blueprint for Other Evidence (E, F, G)
Stage 3:
Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

Use the frame below for developing an analytic rubric for your unit. Not all facet descriptors need to be used—only those that apply to your specific unit.

Explanation	Interpretation	Application	Perspective	Empathy	Self-Knowledge
Sophisticated:	Meaningful:	Masterful:	Insightful:	Mature:	Wise:
In-depth:	Revealing:	Skilled:	Thorough:	Sensitive:	Circumspect:
Developed:	Perceptive:	Able:	Considered:	Aware:	Thoughtful:
Intuitive:	Interpreted:	Apprentice:	Aware:	Developing:	Unreflective:
Naïve:	Literal:	Novice:	Uncritical:	Egocentric:	Innocent:

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MODULE

11

ANCHORING UNIT DESIGNS

If we expect students to do high-quality work, they need to know what high-quality work looks like.

USING THE MODULE

Anchoring refers to the process of selecting examples of student work to characterize performance levels in a scoring rubric. These examples, known as anchors, provide tangible and specific illustrations of various levels of quality or degrees of proficiency that are based upon established criteria. Anchors assist teachers in understanding and consistently applying the criteria and standards when judging student products or performances. They provide teachers and students with clear targets to motivate and guide their efforts, and help students to better understand and apply the criteria when engaged in self-evaluation and peer review.

Educators use two basic models to anchor a scoring system for performance assessments (see Figure 11.1). Model 1 is based on using established scoring criteria contained in a scoring rubric. In this model, teachers evaluate student responses, products, or performances according to the scoring criteria. They sort the scored responses into groups corresponding to the various score points on the scale. For example, responses receiving a "4" would be grouped together, those receiving a "3" would be grouped together, and so forth. They select several responses, products, or performances from each group to illustrate the criteria for that score point. These are the anchors for that score point. Model 1 is appropriate when a performance task and accompanying scoring rubric have been validated through reviews, field testing, and revision.

Worksheet 3.4

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FIGURE 11.1 TWO MODELS FOR ANCHORING A RUBRIC

Model 1 (Based on Scoring Criteria)	Model 2 (Based on Student Responses)
Review the scoring rubric to become familiar with the range and criteria for each score point.	Follow a consensus process to sort student responses into three or four groups according to quality (e.g., high, medium, and low).
Follow a consensus process to evaluate student responses using the scoring criteria.	Decide on the distinguishing characteristics of the "high" responses.
Sort the scored responses into groups corresponding to the score points.	Use these characteristics to identify the criteria for the top score point of the scoring rubric.
Select several responses that best illustrate the distinguishing characteristics for the top score point. These are the anchors for that score point.	Select several responses that best illustrate the distinguishing characteristics for the top score point. These are the anchors for that score point.
Repeat the process for the other score points.	Repeat the process for the other groups of student responses.

Model 2 uses student responses, products, or performances as the basis for identifying or refining scoring criteria. In this model, teachers sort student responses into three (high, medium, and low) or four (excellent, good, fair, and poor) groups based upon general quality. They review each group to determine the distinguishing characteristics of the responses, and use these characteristics to identify specific criteria for each group. Finally, they select several responses that best illustrate those criteria. These responses serve as anchors. Model 2 is appropriate when teachers are using a task and scoring rubric for the first time or when the scoring rubric is in draft form and has not yet been validated.

■ Anchoring provides a basis for setting performance standards. By selecting examples of student work correlated with various levels (score points) in a rubric, educators and other stakeholders are better equipped to answer the question, How good is good enough?

To consider, however, that standard setting is the *only* purpose for anchoring is a misconception. Anchors have two additional benefits. They guide scorers in making more consistent judgments when evaluating student products and performances. And they equip students to engage in more accurate and productive self-assessment. By providing tangible illustrations of the rubric descriptors, the potentially ambiguous language in a rubric (e.g., "well organized" or "persuasive") is exemplified, aiding both teachers and students in better understanding the qualities of effective performance.

■ Educators should beware of the assumption that a single example (anchor) for the top score point in a rubric is sufficient. There may often be more than one effective solution and approach to a performance task. A single example suggests that only one best answer or pathway exists. Teachers should seek multiple examples—"diverse excellence"—for the top score point. Likewise, identifying several weak or flawed examples to illustrate common problems or misconceptions revealed in student products or performances is useful. Selecting several anchors for each point in a scoring scale provides a richer set of examples to guide teachers and students in understanding the criteria and performance levels in a rubric.

MISCONCEPTION ALERT

REFLECTION FROM BOB JAMES

Because this is my first time trying the camp menu performance task, I followed Model 2 of the anchoring process. It was pretty easy to sort most of the student menus into three categories using the stated criteria. I then selected three samples from each set that provided the best illustrations of high, medium, and low quality. I will use these as my anchors.

A fellow teacher suggested that I make copies of the anchors (after obtaining parent permissions) for future use. She also suggested removing the students' names from the anchors that I copy, because the purpose is to show the qualities of work at various performance levels, not to identify who did well and who didn't.

I really like the idea of using anchors as instructional models to help kids see differences in quality. These models should also help students better understand the criteria when they self-assess their menus. I am a little concerned that students might copy the work if I show them examples from previous years. But because we have a variety of possible healthy food options for the menus, I'm hoping that copying will not be a problem.

Now that I understand this process, I plan to select anchors for student work from other units.

The UNDERSTANDING by DESIGN Handbook

STAGE 3

PLAN LEARNING EXPERIENCES AND INSTRUCTION

Modules 12–19

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ◗ Enduring Understandings
- **B** ◗ Essential Questions
- **C** ◗ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ◗ Performance Tasks
  - ➤ Performance Task Blueprint (D)
- **E** ◗ Quizzes, Tests, Prompts
- **F** ◗ Unprompted Evidence
- **G** ◗ Self-Assessment
  - ➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ◗ Sequence of Learning Experiences and Instruction

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MODULE

12

ENGAGING AND EFFECTIVE DESIGN

The design must blend what is engaging with what is effective. Just because a lesson is engaging does not mean it is effective in causing understanding.

USING THE MODULE

Clearly, we want our designs to be engaging. For unless students are provoked, enticed, or intrigued by the work, why would they persist or give their best effort?

But engaging work is insufficient. The work must also be effective. In other words, the work must promote and make possible maximum achievement. The bottom line is performance showing that the design makes students achieve the targeted understandings.

The worksheets in this module provide brainstorming techniques that ask designers to consider, regardless of topic, what is most likely to make work engaging and effective, given the students and classroom context. Worksheet 12.1 focuses on making design engaging. An engaging design stimulates students to actively participate—for example, in solving a problem or answering a question. Worksheet 12.2 focuses on making design effective. An effective design includes appropriate evidence that desired results have been achieved. Worksheet 12.3 uses a Venn diagram to show the relationship between engaging and effective design. The point of these exercises is that hand-on activities do not necessarily ensure that students will develop the desired understandings.

Worksheet 1.6

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MISCONCEPTION ALERT

- An engaging unit is not always an effective unit. An effective unit is one in which students are able to demonstrate good performance results on a credible assessment. Whether students are engaged in their work is a separate issue. The most effective units are those in which most if not all students do well, perhaps much better than expected on insight and work quality, and show surprisingly strong test results.
- The *indicators* of engagement and effectiveness are not the same as the *causes* of engagement and effectiveness. To say, When students are engaged, they do not jump up when the bell rings but stay engrossed in their work, is an indicator of engagement. Such engagement does not explain why they are absorbed; it shows teachers what to look for to see if engagement has occurred. A cause of such engagement might be that the issues are thought provoking—so thought provoking (cause) that students tune out the bells (indicator).

REFLECTION FROM BOB JAMES

We used the effective-engaging worksheets during a faculty meeting. They were most enlightening for our staff! Many of us pride ourselves on the extent to which we involve our kids in hands-on learning, but many admitted that they hadn't given sufficient attention to the issue of effectiveness.

Probably the most valuable insight that evolved from the worksheets was the importance of thinking like an assessor—considering what we will look for to determine if students really understand what we set out to teach. Our grade-level team decided to meet regularly and ask that question before upcoming units. I believe this approach will help our team become even more focused, as well as make our individual teaching more effective.

WORKSHEET 12.1

STAGE 3

ENGAGING DESIGN

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
▸ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
▸ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

1. When are students most *engaged* by their work? What kinds of activities, assignments, tasks, work conditions, goals, and situations tend to keep your students persistently engaged? List specific activities, tasks, and conditions.

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2. In general, what criteria must be met to make a lesson, unit, or task design the most engaging for your students? List some criteria.

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WORKSHEET 12.2

STAGE 3

EFFECTIVE DESIGN

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings B ▸ Essential Questions C ▸ Knowledge and Skills	D ▸ Performance Tasks ▸ Performance Task Blueprint (D) E ▸ Quizzes, Tests, Prompts F ▸ Unprompted Evidence G ▸ Self-Assessment ▸ Blueprint for Other Evidence (E, F, G)	H ▸ Sequence of Learning Experiences and Instruction

1. When are students most *effective* in their work? What kinds of learning activities, guidelines, task directions, goals, and work conditions enable students to be effective in their work (i.e., to maximize assessment performance)? List specific activities and conditions.

-
-
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-

2. In general, what criteria must be met to make a lesson, unit, or task design the most effective for your students? List some criteria.

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-
-
-

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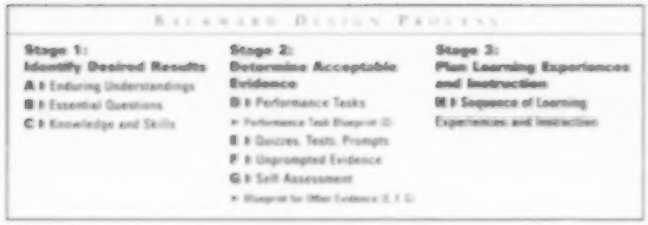
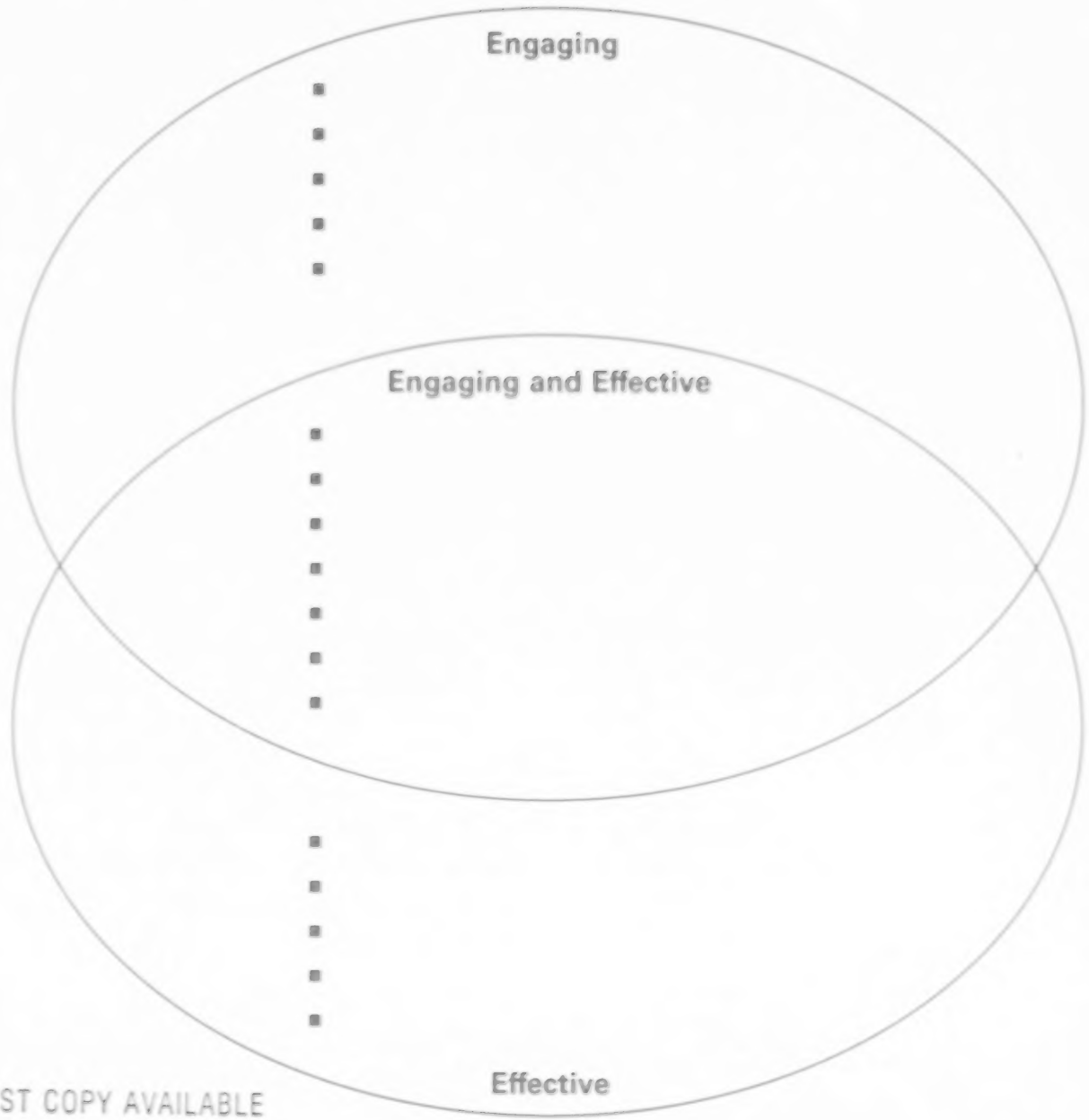
WORKSHEET 12.3

STAGE 3

ENGAGING AND EFFECTIVE DESIGN



Make a Venn diagram showing the relationship between engaging and effective work. What criteria have to be met for *both* to be more likely?



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MODULE

13

UNCOVERAGE

Ultimately, coverage is based on an egocentric fallacy: If I talked about it and we read about it, they got it.

USING THE MODULE

Considering what needs to be uncovered is vital when designing curriculum because big ideas are often subtle, abstract, and unobvious. Teaching that is grounded in textbook coverage only can leave students with a superficial grasp of key ideas and an erroneous view of how knowledge becomes knowledge. Students should come to know what scholars know. Knowledge is the hard won, somewhat tentative fruit of many attempts to understand through constant pondering, testing, and rethinking of ideas. What does it mean to uncover what is in the textbook? Figure 13.1 helps clarify the difference between uncoverage and coverage.

Worksheet 13

The Illusion of Coverage

"This all takes so much time! I cannot possibly do what backward design requires, given my coverage obligations." Although this type of thinking is plausible, we believe it is incorrect. We think the problem is misunderstanding the relationship between results and teaching.

Teachers have to make difficult choices and priorities in instruction. All teaching, including coverage teaching, involves deciding in part what *not* to teach or emphasize. All teaching involves the feeling that possible and desirable learnings are being sacrificed because of lack of time.

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FIGURE 13.1 A Comparison of Uncoverage and Coverage

Uncoverage	Coverage
The text serves as a resource for an independently designed course of study with specific purposes, based on standards.	The text is the syllabus; no explicit purpose exists beyond marching through the text.
The purposes imply various inquiries that culminate in valid and effective performance assessments of understanding.	Assessment involved only tests of knowledge and skill from the content of the textbook.
The text is used to help explore big ideas and overarching essential questions.	The student's job is to know what is in the text; no overarching questions exist.
Sections of the text are read in an order that supports overarching purposes.	The text is read in page order.
The textbook is one resource among many, which include primary-source materials; the textbook often only summarizes important ideas or inferences.	Primary-source and other secondary-source materials are not used; the textbook summaries are taken as givens to be learned, not inferences to be analyzed or critiqued.

Nonetheless, the "coverer" acts under an illusion, we believe: Textbook and test-driven instruction operate under an untested assumption that coverage maximizes state or national test scores. But little evidence supports such a view. So much is passed over without inquiry. Weaker students get confused and lost. Memory is overtaxed in the absence of central questions and ideas to organize inquiries and answers around.

The Irony of Coverage

Coverage involves a sad irony. In the absence of guiding questions, ideas, and methods that are meant to recur and inform learning, students are left to guess about what is most important and what will be tested. Test results reflect this absence: The range of results is great, despite good teaching. The time-honored justification for such coverage is that the syllabus and upcoming tests somehow demand it; that is, "I would *like* to go into greater depth, but I *have* to cover the content." Yet, teachers who make this claim rarely subject it to critical scrutiny. Does such a claim mean that teaching *worse* causes higher test scores?

Such thinking is implied by their rationale. But let's stop and rethink this rationale by asking a few questions:

■ *What methods of teaching ensure the greatest retention and recall of facts?* Surely, they are not ones that are essentially composed of unconnected lectures and readings, with no prioritized knowledge using overarching ideas or performance goals to guide note taking and studying. Retention and recall are enhanced when learners have a sense of the big ideas, some organizational schema upon which to connect discrete facts and skills, and opportunities to use acquired knowledge and skills in meaningful ways.

■ *When one compares classrooms with the highest test scores to those with the lowest test scores, does one see more or less uncoverage and performance-based work in the former or the latter classrooms?* In our experience, the best test scores correlate with more active and intellectually provocative forms of instruction, and the worst scores are seen in classrooms that rely on simplistic worksheets, busywork having no larger purpose, and a "copy down my notes from the blackboard" approach. Recent research by Newmann (1997) and colleagues supports the idea that more authentic work leads to better overall student performance.

■ *Has the teacher who only covers content conducted action research to justify that the coverage approach yields optimal results?* Few teachers have done systematic research into their own practice. Rather, they grow comfortable with their habits, invariably developed in isolation with limited exposure to other ways of teaching. They fear that new approaches to instruction will jeopardize results—a reasonable fear—but invalid as a reason for not examining evidence on whether their coverage approach is the most effective.

■ ■ ■ ■ ■

Several exercises assist designers in thinking through the coverage versus uncoverage dilemma. Worksheets 13.1 and 13.2 guide users to think about the meanings of the two terms and the reasons that teachers feel compelled to cover the content instead of going into depth. Figures 13.2 and 13.3 show examples of meanings and reasons. Worksheet 13.3 provides a set of criteria to help designers better identify the ideas in their unit needing uncoverage.

MISCONCEPTION ALERT

Coverage works under a false logic by confusing correlation with causality—that short-answer test results correlate with important performance. Teaching to items using a coverage approach does not cause important performance. For example, to practice a doctor's physical exam as a way of becoming fit and well is ludicrous. The reality is the other way around. If we are physically fit and live in a healthy manner, we will pass the physical. The separate items on the physical are not meant to be taught and crammed for; they serve as indirect measures of our normal healthful living. Multiple-choice answers may *correlate* with more genuine abilities and performance, yet mastery of such test items does not *cause* achievement. Standardized tests were not invented to be directly taught to. Indeed, we corrupt their meaning if we teach to them. Rather, they were meant to be the easiest ways possible of testing classroom-developed knowledge and skills indirectly and inexpensively.

REFLECTION FROM BOB JAMES

Does anything in the nutrition unit require in-depth and deliberate uncoverage? Well, sure. It isn't easy to grasp the idea that nutritional needs vary according to individual characteristics. There is no such thing as a one-size-fits-all diet. Are there typical misunderstandings that I ought to more deliberately focus on? Well, as I think about it, I *have* found that many students harbor the belief (misconception) that if food is good for you, it must taste bad. One of my goals in this unit is to dispel this myth so that they won't have an automatic aversion to healthy food.

FIGURE 13.2

Corresponds to WS 13.1

STAGE 3

COVERAGE VERSUS UNCOVERAGE

(Part 1) *Examples*

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

As much as going into great depth and breadth on a topic is a desirable aim, sooner or later we all feel that we have to cover the content. What do we mean when we say this? What are the reasons that prevent us from doing what we think would be wiser pedagogically? The following prompts ask you to reflect on the meaning of *cover* and *uncover*.

1. Consider the terms *cover* and *uncover*. What does each term suggest? What images come to mind? What synonyms could be used to explain each term and the differences between them? List your ideas.

Cover	Uncover
■ survey, mention, once over lightly, overview	■ probe, discover, inquire, depth

2. Share and discuss your lists with colleagues. What are the implications for curriculum design, assessment, and teaching? List some below. Use your meanings and connotations of *cover* and *uncover* as a basis.

Implications of Coverage

■ lecture approach favored, short-answer tests

■ implied need to worry about state tests of content knowledge

Implications of Uncoverage

■ problem-based work, primary-source documents used

■ different points of view, more authentic student performance

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FIGURE 13.3

Corresponds to WS 13.2

STAGE 3

COVERAGE

VERSUS

UNCOVERAGE

(Part 2) *Examples*

BACKWARD DESIGN PROCESS		
Stage 1: Identify Desired Results	**Stage 2: Determine Acceptable Evidence**	**Stage 3: Plan Learning Experiences and Instruction**
A ▸ Enduring Understandings	**D** ▸ Performance Tasks	**H** ▸ Sequence of Learning Experiences and Instruction
B ▸ Essential Questions	➢ Performance Task Blueprint (D)	
C ▸ Knowledge and Skills	**E** ▸ Quizzes, Tests, Prompts	
	F ▸ Unprompted Evidence	
	G ▸ Self-Assessment	
	➢ Blueprint for Other Evidence (E, F, G)	

3. Try to sort out excuses for not rethinking old habits, as opposed to real impediments to reform or sound instructional reasons to cover only the content. Write them below.

Real Impediments

- My course is a survey course, and the state exam tests for familiarity of content only.

- There is no time to collaboratively redesign more conventional courses to make them uncoverage focused.

Excuses

- The textbook for this course is massive, and the chapter tests are multiple choice.

- There is no time to do this kind of work with students.

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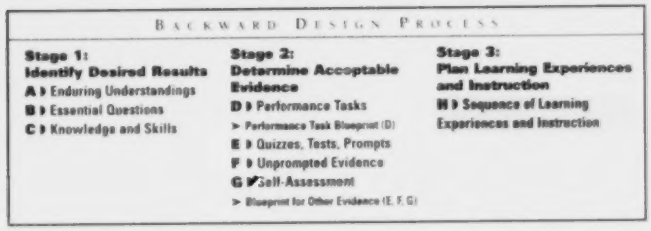
WORKSHEET 13.1

Corresponds to Fig. 13.2

STAGE 3

COVERAGE VERSUS UNCOVERAGE

(Part 1)


BACKWARD DESIGN PROCESS
Stage 1:
Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills
Stage 2:
Determine Acceptable Evidence
D ▸ Performance Tasks
➤ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➤ Blueprint for Other Evidence (E, F, G)
Stage 3:
Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

As much as going into great depth and breadth on a topic is a desirable aim, sooner or later we all feel that we have to cover the content. What do we mean when we say this? What are the reasons that prevent us from doing what we think would be wiser pedagogically? The following prompts ask you to reflect on the meaning of *cover* and *uncover*.

1. Consider the terms *cover* and *uncover*. What does each term suggest? What images come to mind? What synonyms could be used to explain each term and the differences between them? List your ideas.

Cover	Uncover
■	■
■	■
■	■

2. Share and discuss your lists with colleagues. What are the implications for curriculum design, assessment, and teaching? List some below. Use your meanings and connotations of *cover* and *uncover* as a basis.

Implications of Coverage

■

■

Implications of Uncoverage

■

■

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WORKSHEET 13.2

Corresponds to Fig. 13.3

STAGE 3

COVERAGE VERSUS UNCOVERAGE (Part 2)

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
➢ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

3. Try to sort out excuses for not rethinking old habits, as opposed to real impediments to reform or sound instructional reasons to cover only the content. Write them below.

Real Impediments

-
-
-
-

Excuses

-
-
-
-

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WORKSHEET 13.3

STAGE 3

WHAT NEEDS UNCOVERING?

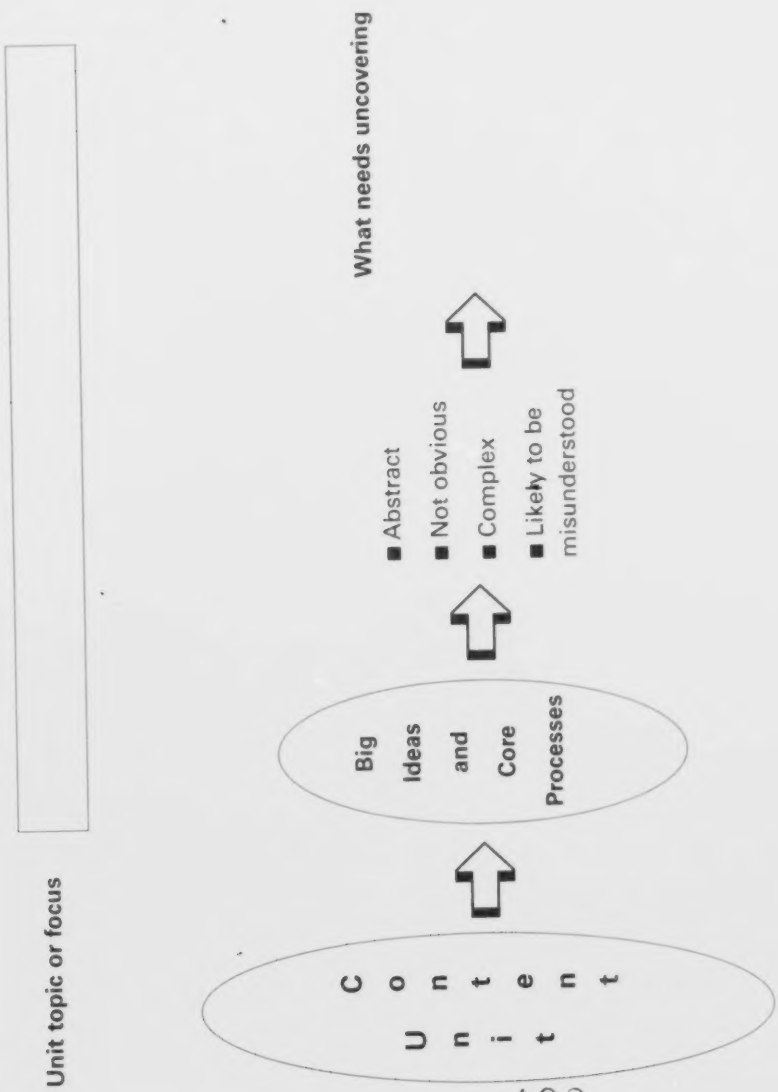
BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ➤ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

What needs uncovering in your unit? Use the criteria as filters to help identify what needs to be uncovered so that students will be more likely to understand.



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MODULE 14

MISUNDERSTANDING

Making the matter of greater urgency is that research over the past 20 years confirms the shocking depth and breadth of a phenomenon: Many students, even the best, appear to understand their work—as shown by tests and in-class discussion—only to later reveal significant misunderstanding of what they learned when asked to answer follow-up questions or to apply what they learned.

USING THE MODULE

Students often leave school with misunderstandings about what (we thought) they had learned. Howard Gardner, David Perkins, and their Harvard colleagues at Project Zero have summarized the findings on misconceptions eloquently and thoroughly:

> [What] an extensive research literature now documents is that an ordinary degree of understanding is routinely missing in many, perhaps most students. It is reasonable to expect a college student to be able to apply in new context a law of physics, or a proof in geometry, or the concept in history of which she has just demonstrated acceptable mastery in her class. If, when the circumstances of testing are slightly altered, the sought-after competence can no longer be documented, then understanding—in any reasonable sense of the term—has simply not been achieved.
>
> —Gardner, 1991, p. 6

Even conventional testing can reveal such failures to understand. Consider this result in mathematics: Most U.S. teenagers study Algebra I and get passing grades. Yet National Assessment of Educational Progress (NAEP) results show that only 5 percent of U.S. adolescents perform well at tasks requiring higher-order use of Algebra I knowledge (NAEP, 1988). The recent Third International Math and Science Study (TIMSS) reached a similar conclusion for science in one of the most

Worksheet 3.6

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exhaustive studies to date (reprinted in *Trenton Times* [1997]). And so did NAEP's most recent test, showing "a stark gap between the ability of students in general to learn basic principles, and their ability to apply knowledge or explain what they learned" (*New York Times*, 1997, p. 19). The test was a mixture of multiple-choice, constructed response, and performance task questions. More prosaically, Jay Leno's on-the-street interviews about basic historical facts (Why do we call July 4 Independence Day? Independence from whom and what? In what year?) reveal that many U.S. citizens neither retain the most basic facts of their schooling nor the meaning of the facts that they can recall.

Striking research on misconceptions has been conducted over two decades in physics and astronomy. Such research is familiar to many teachers through the videotape *A Private Universe* (Schneps, 1989) and the recently released series *Minds of Their Own*, developed by the Harvard astrophysics department. (The tapes are available through the Annenberg science and mathematics videotape collection.) Here we see and hear Harvard students at commencement unable to properly explain why it is colder in winter and warmer in summer. They continue to harbor the naive misconception that the earth is farther away from the sun during winter and closer during summer. A moment's thought would have reminded them that it is summer in Australia in December and always warm at the equator. The cause of seasonal change has to do with the earth's tilt, thus the duration and strength of the sun's rays.

Anticipating Misconceptions in Design

After stating an understanding target as a set of specific generalizations, educators can better appreciate the importance of confronting student misconceptions in assessment and lesson design. A generalization is abstract, *not* self-explanatory, and its meaning is not self-evident to a novice. When a big idea is familiar to a teacher but new to students, possibilities for student misunderstandings arise, particularly if students mistakenly view lessons as jargon or a catechism to be learned, with no insight into what the lessons mean, why they are so, or why they matter.

Referring to our Civil War example (discussed in Module 5), it is not self-evident to students that the Civil War was fought over issues other than slavery, or that much economic self-interest was cloaked in the guise of a moral stance about freedom

and states' rights. A more specific framing of the target as a set of nonobvious propositions makes clearer the likely misconceptions that the unit must overcome.

Designers may thus find it helpful to conclude their desired understandings with parenthetical alerts about possible or likely student misunderstandings—for example, "Students will understand that the Civil War was fought primarily over states' rights issues linked to differences in regional economies (not over the morality of slavery, as commonly believed)."

Because we teach for an understanding does not mean that students will leave with it or avoid misunderstanding. We not only need to aim for more specific and worthy understandings, but also to ferret out and assess for the beliefs that have not been removed by our teaching. The challenge provided to us by the misconception research is that student opinion is often more resistant to change than we imagine. Consider the research in misconception about transfer of heat, provided in Benchmarks for Science Literacy (American Association for the Advancement of Science, 1993), to show how persistent such misconceptions can be:

Heat transfer.

> Middle school students do not always explain the process of heating and cooling in terms of heat being transferred. Some students think that "cold" is being transferred from a colder to a warmer object, others that both "heat" and "cold" are transferred at the same time. . . . Even after instruction, students don't always give up their naive notion that some substances (for example, flour, sugar, or air) cannot heat up or that metals get hot quickly because they "attract heat" . . . or "hold heat well" (pp. 337–338).

The challenge is to better anticipate misunderstandings and attack them more aggressively in our design work, not just as they arise as surprises in teaching.

Student misunderstanding will likely increase the more the ideas in question

- Are abstract (i.e., based upon subtle concepts and generalize from prior inquiries).
- Require prior knowledge or life experience and reflection to be fully grasped.
- Are counterintuitive, not obvious, unfamiliar, or esoteric.
- Are presented in summary fashion through secondary sources (such as science, history, and mathematics textbooks).

Checks for Misunderstanding

The purpose of ongoing assessment is to ferret out misconceptions and misunderstandings before it is too late—that is, before the unit concludes and teachers engage in summative assessment. How will we determine if students *really* understand what they are learning? Given both a teacher's propensity to hear correct answers as indicative of understanding and students' desire to appear as if they understand even if they don't, the teacher needs to be ever vigilant. Consider this humorous maxim based on a judicial analogy: Students should be assumed innocent of understanding until proven guilty. Just because eight students understand and no further questions are asked doesn't mean the other students understand. Just because students provide a simple correct answer on cue doesn't mean they can use that knowledge on their own or know when it is called for when no cue is given.

How then might teachers determine if students really understand *before* a final exam or culminating performance? Over the years, teachers have developed a

➤ **MISCONCEPTION ALERT**

■ A common misconception is that misunderstanding is due to ignorance; thus, it can be solved by knowledge. But misunderstanding is not ignorance, and knowledge often fails to eradicate misunderstanding, as the misconception research in physics and arithmetic has long revealed.

Misunderstanding is often an erroneous but *plausible* mapping of a familiar idea or strategy onto new situations, such as when a child asks, "Dad, are Spanish and English using the same words, but just pronouncing them differently?"

■ A misconception about informal checks for understanding is to assume that assessment always requires a score or grade. Such an assumption confuses assessing with making a value judgment. Teachers do need not to assign a grade to a piece of work to offer commentary about its strength and weakness. The phrase "formative assessment" is meant to convey the idea that some forms of assessment are designed to support teaching and learning, rather than simply to provide scores or measures. We may choose to score or grade formative assessments, but we are not required to.

■ Teachers should beware of attributing to all students what is revealed in the comments or work of only a few. A key reason to engage in ongoing assessment of all students as a part of instruction, rather than only after instruction, is that such feedback greatly improves a teacher's and students' likelihood of success.

variety of informal techniques to ensure that students understand *while* they are learning. We offer a few in Figure 14.1.

Three exercises are included in this module to assist educators in addressing the likelihood of misconceptions and misunderstandings *by design*. Worksheet 14.1 examines the characteristics of content topics that students are likely to misunderstand (e.g., an idea that is counterintuitive). Worksheet 14.2 prompts designers to consider the predictable misunderstandings likely to arise when students tackle particularly challenging topics. Worksheet 14.3 encourages teachers to plan ways of checking for prior misconceptions at the *beginning* of a unit and for misunderstandings *along the way* as they teach.

REFLECTION FROM BOB JAMES

What are some typical misunderstandings my students may have about nutrition? Let's see what the Project 2061 benchmarks say: "Lower elementary school children . . . may believe that energy and strength result from exercise but not nutrition. . . . After instruction, middle school students are often unable to explain their knowledge in scientific terms." I have heard that first mistake before. I think I'll plan a quiz early in the unit to check for this misconception.

I found the list of informal checks for understanding useful. Although I think that one of my strengths as a teacher is my questioning, which I regularly use to stimulate students' thinking and check their understanding, I was not familiar with the other techniques. I particularly like the hand signals, which I've already started using with great effect. In fact, I've added my own twist: I ask students to close their eyes before signaling. That way, they are less likely to indicate that they understand when they really don't for fear of what other students might think. I also like the analogy prompt, although I'm not sure that it will be appropriate for all my students. I plan to use visual representations because they will enable some of my less articulate students to show what they understand.

As I think more about misconceptions, I recall that many students harbor the belief that if food is good for you, it must taste bad, and vice versa. One of my goals in this unit is to dispel this myth so that students won't have an automatic aversion to healthy food. I think I'll include some informal checks to see if this year's students harbor this misunderstanding, too.

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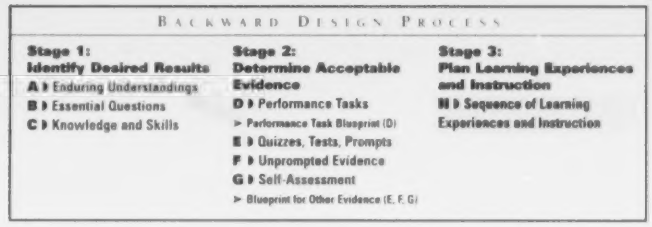
FIGURE 14.1

STAGE 3

TECHNIQUES TO CHECK FOR UNDERSTANDING


BACKWARD DESIGN PROCESS
Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills
Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
➢ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➢ Blueprint for Other Evidence (E, F, G)
Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

Hand Signals

Ask students to display a designated hand signal to indicate their understanding of a specific concept, principle, or process:

- I understand _____ and can explain it (e.g., *thumbs up*).
- I do not yet understand _____ (e.g., *thumbs down*).
- I'm not completely sure about _____ (e.g., *wave hand*).

Index Card Summaries and Questions

Periodically, distribute index cards and ask students to complete the following statements, using both sides of a card:

(Side 1) Based on our study of _____ (unit topic), list a big idea that you understand, and write it as a summary statement.

(Side 2) Identify something about _____ (unit topic) that you do not yet fully understand and word it as a statement or question.

Question Box or Board

Establish a location (e.g., question box, bulletin board, or e-mail address) where students may leave or post questions about concepts, principles, or processes that they do not understand. This technique may benefit students who are uncomfortable admitting publicly that they do not understand.

Analogy Prompt

Periodically, present students with an analogy prompt:

_____ (designated concept, principle, or process) is like _____ because _____.

Visual Representations

Ask students to create a visual representation, such as a web or concept map, flow chart, or time line, to show the elements or components of a topic or process. This technique effectively reveals whether students understand the relationships among the elements.

Misconception Check

Present students with common or predictable misconceptions about a designated concept, principle, or process. Ask them whether they agree or disagree and why. The misconception check can also be presented as a multiple-choice or true-false quiz. Keep in mind that a "distractor" on a multiple-choice test is designed to see if students fall for a plausible but incorrect answer.

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WORKSHEET 14.1

STAGE 3

MISUNDERSTANDINGS AND MISCONCEPTIONS

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction

Research in cognition and learning suggests that students sometimes misunderstand what they have been taught in school. In some cases, they come to school with misconceptions that are difficult to detect and correct. These misunderstandings may be hidden by test results, misleading teachers into thinking that students understand what they don't in fact understand.

1. What are some ideas that typically confuse students? What do students frequently misunderstand? List one or two examples.

-
-

2. Give examples of misconceptions that students may bring to school and that are difficult to overcome.

-
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3. Consider the examples identified above. In general, what makes an idea likely to be misunderstood? For example, ideas that are counterintuitive (e.g., dividing fractions yields a larger number) tend to be misunderstood. List other characteristics of easily misunderstood ideas.

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WORKSHEET 14.2

ANTICIPATING MISUNDERSTANDINGS

STAGE 3

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings B ▸ Essential Questions C ▸ Knowledge and Skills	D ▸ Performance Tasks ➤ Performance Task Blueprint (D) E ▸ Quizzes, Tests, Prompts F ▸ Unprompted Evidence G ▸ Self-Assessment ➤ Blueprint for Other Evidence (E, F, G)	H ▸ Sequence of Learning Experiences and Instruction

Targeted Understanding	Likely Misunderstanding
The Civil War was fought primarily over states' rights issues linked to differences in regional economies.	The Civil War was fought over the evil of slavery, and the "good guys" won.
Friendship is revealed more through challenging times than during happy times.	People whom you hang with are your friends. Once a friend, always a friend.
Gravitational force is the only significant force acting on a ball once it has been thrown.	When a ball is thrown by a pitcher, there are two forces acting on it as it travels toward a catcher.
The same data can be represented in different ways. The representation of data can affect the data's interpretation.	Numbers never lie. Statements that include statistical evidence must be true.

Using the above examples as a guide, complete the table below to identify likely misunderstandings for your unit or course.

Targeted Understanding	Likely Misunderstanding

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WORKSHEET 14.3

STAGE 3

UNCOVERING MISUNDERSTANDINGS

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings B ▸ Essential Questions C ▸ Knowledge and Skills	D ▸ Performance Tasks ➢ Performance Task Blueprint (D) E ▸ Quizzes, Tests, Prompts F ▸ Unprompted Evidence G ▸ Self-Assessment ➢ Blueprint for Other Evidence (E, F, G)	H ▸ Sequence of Learning Experiences and Instruction

Consider the big ideas of your unit when answering the questions below.

1. Given the possibility that misunderstandings may occur, how would you diagnose previously formed misconceptions *at the beginning* of the unit?

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2. How would you check for misunderstandings *during* the unit?

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-
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MODULE

15

WHERE

Just as telling a story needs the elements of plot, characters, and setting to make the story engaging and effective, designing a curriculum needs elements to make student understanding engaging and effective.

USING THE MODULE

Clearly specified understanding targets and valid, challenging assessments do not guarantee an effective and engaging unit of study. Knowledge of the target and assessment does not specify what to do in instruction and how to best sequence the unit for maximum effectiveness. How and when should teachers present specified material? In what ways? What different kinds of lessons need to occur to make performance success most likely? We use the acronym WHERE to guide teachers on where to focus their efforts:

Where the work is headed and the purpose of day-to-day work.

Hook students with engaging work that makes them more eager to explore key ideas.

Explore the subject in depth, *equip* students with required knowledge and skill to perform successfully on final tasks, and help them *experience* key ideas.

Rethink with students the *big* ideas; students *rehearse* and *revise* their work.

Evaluate results and develop action plans through self-assessment of results.

All these elements may not be needed in each unit, but as design guidelines and self-assessment criteria, they alert teachers to considering students as would-be performers. Such guidelines move teachers from thinking only about what *they*

Worksheet 3.6

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MISCONCEPTION ALERT

We stress here that WHERE, like the facets, serves more as a *criterion* for design than as a *chronology* or step-by-step recipe for design. Recall that Bloom's (1956) taxonomy represents a way of judging assessment items and tasks for cognitive difficulty and is not a rigid prescribed sequence for teaching. Similarly, WHERE represents a way of testing lessons and units rather than a recipe for building them.

Just as a storyteller might begin with fragments of dialogue or a character and work toward plot (or vice versa), design work, too, can emerge over time following many different paths and sequences. For example, a teacher might introduce a unit by presenting the final task in preliminary form as a written draft.

want to do and need to accomplish to thinking about what *students*—end users of their design—will need to achieve understanding.

If we were software designers, we would have to ensure that all the code we have written and all the functions we have built into an application are going to become truly user friendly, elegant, and powerful. In a sense, as teachers, we come to realize that we *are* intellectual software designers: Students will be using our design to accomplish important learning tasks.

A planning frame (Worksheet 15.1) provides a series of questions to prompt designers to deliberately include the WHERE elements in their unit plan. An example (Figure 15.1) illustrates its application to the nutrition unit.

REFLECTION FROM BOB JAMES

Just when I think I've got it nailed, I'm finding that my thinking about the nutrition unit is being stretched by WHERE. Here are my current ideas:

W – The backward design process has really helped me clarify where I'm going with the unit. Now I need to think about how I can help students know where they are headed, and why. I think my unit will help give direction, especially because I plan to post these questions on the classroom bulletin board

But I probably can make the goals even clearer by introducing the assessment tasks and the corresponding evaluative criteria and rubrics early in the unit. With these performance targets in mind, I'm hoping that the kids will more clearly see the purpose for the particulars they'll be learning—the food groups, the food pyramid, how to read nutrition information on food labels, and so on.

H – I like the suggestion of starting with a hook, something to capture students' interest in the topic. Our social studies textbook has a section on explorers that will work well, I think. The kids love mysteries, and this is one: a story of 16th and 17th century ocean-going sailors who developed a mysterious disease (now known as scurvy) during long months aboard ship. Their condition improves dramatically when they arrive back on land. Once students learn that the disease resulted from a lack of vitamin C, and that consuming fresh fruits and vegetables was the medicine, we will be poised to examine the role of nutrition in health.

E – I think that the new lessons I have planned will do a good job equipping my students for the performance tasks and project. I believe that my teaching will be much more focused now that I've thought through my desired understandings and the assessment evidence I need to collect.

R – The rethinking portion of unit design is probably the greatest stretch for me. Other than when we use revision as a part of the writing process, I have rarely asked my students to formally rethink the ideas we discuss. Yet I'm beginning to realize how important it can be.

Two interesting questions came up during my lunchroom discussion with other teachers. I can use one or both questions midway in the unit to challenge students to refine their thinking about nutritious eating: If allowed to eat anything they wanted, would children eat a balanced diet? and, Do animals eat foods that provide for their nutritional needs? These questions point to another essential question: Does Mother Nature lead living creatures in the direction of nutritious eating? I think that these provocations should stimulate discussion and rethinking, and lead to interesting questions for further research.

E – The performance tasks and culminating camp menu project will give students several opportunities to exhibit their understanding of healthy eating.

the major goal of the unit. Before evaluating, I will involve the class in a peer review of the camp menus in cooperative learning groups so that students will receive feedback. I'll allow time for menu revisions before their final menus are due. Finally, I will ask each student to complete two self-assessments: one for their camp menu, using the rubric; and the second, a reflection on if (and how) their personal eating habits have changed as a result of what they have learned during the unit. These activities should bring the unit to an effective close.

I think that WHERE definitely enhances the nutrition unit, and I intend to use it when planning other units. I'm anxious to see what the results will be with my students.

FIGURE 15.1

Corresponds to WS 15.1

STAGE 3

UNIT DESIGN CONSIDERATIONS USING WHERE

Nutrition Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

	Questions for the Teacher	Responses from the Teacher
W	How will you help students know *where* they are headed and *why* (e.g., major assignments, performance tasks, and criteria by which the work will be judged)?	■ Post essential questions on a bulletin board. ■ Review the rubric for the camp menu performance task and evaluate sample menus for previous years. ■ Print handouts that specify the performance requirements, deadlines, checklists, rubrics, and reference materials.
H	How will you *hook* students through engaging and thought-provoking experiences (e.g., issues, oddities, problems, and challenges) that point toward big ideas, essential questions, and performance tasks?	■ Begin a unit with a problem-based learning mystery (e.g., the seafarer's disease [scurvy] that cleared up once fresh vegetables and fruits and were eaten). ■ Challenge students to react to the statement, "If food is good for you, it must taste bad."
E	What events, real or simulated, can students *experience* to make the ideas and issues real? What learning activities will help students to *explore* the big ideas and essential questions? What instruction is needed to *equip* students for the final performances?	■ Explore such ideas as surveying the healthy eating habits of different ethnic groups; searching the Web for nutrition advice; and researching correlations between diet, school absence, and academic and athletic performance. ■ Equip students with skills in survey writing, oral interviews, and research, including searching on the Internet.
R	How will you cause students to *reflect* and *rethink* to dig deeper into the core ideas? How will you guide students in *rehearsing, revising,* and *refining* their work based on feedback and self-assessment?	Ask students to work in groups to ■ Evaluate different diets for nutritional balance (e.g., a hypothetical average diet and an exemplary diet). ■ Reflect on their own and their family's eating and cooking habits. ■ Propose changes (if needed) to their family's diet in light of their increased understanding of the elements of good nutrition.
E	How will students *exhibit* their understanding about their final performances and products? How will you guide them in self-*evaluation* to identify the strengths and weaknesses in their work and set future goals?	■ Students self-assess their work on the key performance tasks (illustrated nutrition brochure and camp menu). ■ Students create a nutritional action plan for themselves and their family to promote healthy eating.

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WORKSHEET 15.1

Corresponds to Fig. 15.1

STAGE 3

UNIT DESIGN CONSIDERATIONS USING WHERE

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

	Questions for the Teacher	Responses from the Teacher
W	How will you help students know *where* they are headed and *why* (e.g., major assignments, performance tasks, and criteria by which the work will be judged)?	■ ■ ■ ■
H	How will you *hook* students through engaging and thought-provoking experiences (e.g., issues, oddities, problems, and challenges) that point toward big ideas, essential questions, and performance tasks?	■ ■ ■ ■
E	What events, real or simulated, can students *experience* to make the ideas and issues real? What learning activities will help students to *explore* the big ideas and essential questions? What instruction is needed to *equip* students for the final performances?	■ ■ ■ ■ ■
R	How will you cause students to *reflect* and *rethink* to dig deeper into the core ideas? How will you guide students in *rehearsing, revising,* and *refining* their work based on feedback and self-assessment?	■ ■ ■ ■ ■
E	How will students *exhibit* their understanding about their final performances and products? How will you guide them in self-*evaluation* to identify the strengths and weaknesses in their work and set future goals?	■ ■ ■ ■ 213

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MODULE

16

QUESTIONS TO GUIDE TEACHING

The cultivation of reflectiveness is one of the great problems one faces in devising curricula: how to lead children to discover the powers and pleasures that await the exercise of retrospection. [One answer] is the use of the organizing [question]. They serve two functions, one of them the very obvious though important one of putting perspective back into the particulars. The second is less obvious and considerably more surprising. The questions often seemed to serve as criteria for determining where [students] were getting, how well they were understanding, whether anything was emerging.

—BRUNER, 1973, PP. 449–450

USING THE MODULE

In Module 6, we discussed the role of essential questions (overarching and topical) in framing the unit and focusing teaching and learning. Now we consider two other types of questions that are useful in teaching for understanding.

Worksheet 3.6

Entry Questions

Despite their provocativeness and ability to suggest important lines of inquiry, essential questions may not always serve as the most fruitful doorway into a topic. A question may simply prove to be too global, esoteric, abstract, or inaccessible for students (e.g., Is biology destiny?). Thus, the more specific topical and overarching questions that frame each unit are often what teachers rely on to guide instruction and focus learning.

But even topical essential questions may not initially connect with students' experiences or interests. Students may have a hard time seeing the relationship of an essential question to the facts and skills they are expected to learn. How, then, do we introduce them to big-idea questions and issues? How do we make questions an accessible and useful foundation upon which inquiry and performance can be built? By starting units with provocative and specific entry-point questions

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(and activities that raise such questions), we point toward larger ideas and questions.

Students of all ages need concrete and meaningful experiences, problems, applications, and shifts of perspective to enable an important question to arise. An abstract discussion of property rights is quickly made more accessible and intriguing by asking students if the saying, "Finders keepers, losers weepers," is a sound moral principle, and by building role-play around the idea. Then, in discussing the exercise, the larger questions about property naturally arise. Similarly, one might start a unit on gravitational force by asking, How does a roller coaster work?

Students must come to see that hands-on activities are designed to raise important questions and ideas, not just involve pleasant experiences or outings. The actions of an activity may always have closure, but the intellectual issues raised should not. If teachers do their preliminary entry question and activity-design work well, students are more likely to spontaneously ask overarching and essential questions or more quickly see their importance. In fact, such student questions are a key indicator that the activities have succeeded and that the initial part of the design is effective in enabling understanding and interest to develop.[1]

Examples of possible entry questions for a nutrition unit are presented in Figure 16.1. The accompanying worksheet (Worksheet 16.1) may be used to generate possible entry questions for your unit.

Ongoing Questioning and Probing

Teaching for understanding includes the strategic use of questioning daily to stimulate students to think (and re-think) about big ideas as a means of helping them deepen their understanding. The six facets offer a valuable framework for generating these ongoing questions. Figure 16.2 presents a series of question starters, based on the facets. Such questions are effectively followed by probes. Here are examples of probes:

- Why?
- How do you know?
- Do you agree?
- Explain.
- What do you mean by _____ ?

1 Some educators use the term "scaffolding" or "guiding" questions to describe such entry questions, but we think there is a slight difference in meaning. Certainly, an entry question is an attempt to scaffold the work of a unit and make the core ideas more accessible. But scaffolding questions are also used to help students bridge gaps in their understanding, knowledge, and skill along the way. In other words, scaffolding questions are used not only as an entry into a topic but as teacher feedback and guidance when students do not sufficiently grasp key content.

- Can you give an example?
- Tell me more.
- Give your reasons.
- But what about _____?
- Can you find that in the text?
- What data support your position?

MISCONCEPTION ALERT

- A common teacher error in questioning, stemming from a misconception about the aim of questions, is to assume that only questions that students can definitely answer are appropriate for instructional use. The whole point of essential questions is often to challenge the idea that there is only one answer or way to look at a situation, issue, or set of facts. Also, teachers should not shy away from asking questions for which they do not have clear and thorough answers—as long as the questions will stimulate productive thinking and greater depth of learning.
- On the other hand, a common error when asking essential questions is to make the mistake of transmitting the view that all answers are equally valid. The old adage still applies: No clear right answers may exist, but some answers are better than others, namely, the ones that have better argument, evidence, and predictability on their side.

In addition to its value to provoke thought, ongoing questioning serves another purpose—to ferret out possible misunderstandings or misconceptions. By eliciting student ideas, theories, solutions, and interpretations throughout the unit, teachers can more easily determine the degree of student understanding or misconception and adjust as needed.

REFLECTION FROM BOB JAMES

Ever since I began teaching, I have tried to get my students to stretch their thinking by asking idea-sharpening questions, such as, Can you give another example of _____? How does ____ relate to ____? What might happen if _____? Do you agree with _____? and, Why? Although I think I'm pretty good at posing these ongoing questions, I have never really used entry questions in the way that is suggested here.

The essential question for the nutrition unit, What is healthful eating? may not grab my kids. Perhaps a more provocative entry question would be, Can food that is good for you also taste good? I think that this question might work because kids at this age are fond of junk foods, and many seem to believe that if food is nutritional, it has to taste yucky. Because I try to give my kids some say in what they'll be learning, I'll also ask them for any questions that interest them about eating and health. Their ideas could lead to other entry questions I can use in future years.

FIGURE 16.1

Corresponds to WS 16.1

STAGE 3

GENERATING ENTRY QUESTIONS

Nutrition Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
➤ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

A unit can often be made more engaging if provocative questions introduce its major topics. Use the prompts below to help you generate possible entry questions to hook and entice students.

Understandings and essential questions to be addressed in the unit

- A balanced diet contributes to physical and mental health.
  - What is healthful eating?
- The USDA food pyramid recommendations provide relative guidelines for healthful eating.
  - Can a healthy diet for one person be unhealthy fo another?

To generate entry questions and problems for the unit, consider

- Weird facts, discrepant events, and anomalies.
- Issues and problems that students can relate to and that raise essential questions.
- Proverbs, aphorisms, and folk wisdom.
- Interesting questions that have arisen when you have taught or studied this content.

Do you agree with the saying, "You are what you eat"?

What would happen if you only ate junk food?

?

Do the foods that are good for you have to taste bad?

Will an apple a day really keep the doctor away?

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FIGURE 16.2

STAGE 3

QUESTIONING FOR UNDERSTANDING

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings B ▸ Essential Questions C ▸ Knowledge and Skills	D ▸ Performance Tasks ➢ Performance Task Blueprint (D) E ▸ Quizzes, Tests, Prompts F ▸ Unprompted Evidence G ▸ Self-Assessment ➢ Blueprint for Other Evidence (E, F, G)	H ▸ Sequence of Learning Experiences and Instruction

Explanation

What is the key idea in _____?

What are examples of _____?

What are the characteristics/parts of _____?

How did this come about? Why is this so?

What caused _____? What are the effects of _____?

How might we prove/confirm/justify _____?

How is _____ connected to _____?

What might happen if _____?

What are common misconceptions about _____?

Interpretation

What is the meaning of _____?

What are the implications of _____?

What does _____ reveal about _____?

How is _____ like _____ (analogy/metaphor)?

How does _____ relate to me/us?

So what? Why does it matter?

Application

How and when can we use this _____ (knowledge/process)?

How is _____ applied in the larger world?

How might _____ help us to _____?

How could we use _____ to overcome _____?

Perspective

What are different points of view about _____?

How might this look from _____ 's perspective?

How is _____ similar to/different from _____?

What are other possible reactions to _____?

What are the strengths and weaknesses of _____?

What are the limits of _____?

What is the evidence for _____?

Is the evidence reliable? Sufficient?

Empathy

What would it be like to walk in _____ 's shoes?

How might _____ feel about _____?

How might we reach an understanding about _____?

What was _____ trying to make us feel/see?

Self-Knowledge

How do I know _____?

What are the limits of my knowledge about _____?

What are my blind spots about _____?

How can I best show _____?

How are my views about _____ shaped by _____ (experiences, habits, prejudices, or style)?

What are my strengths and weaknesses in _____?

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WORKSHEET 16.1

Corresponds to Fig. 16.1

STAGE 3

GENERATING ENTRY QUESTIONS

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
➤ Performance Task Blueprint (D)
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A unit can often be made more engaging if provocative questions introduce its major topics. Use the prompts below to help you generate possible entry questions to hook and entice students.

Understandings and essential questions to be addressed in the unit

-
-
-
-

To generate entry questions and problems for the unit, consider

- Weird facts, discrepant events, and anomalies.
- Issues and problems that students can relate to and that raise essential questions.
- Proverbs, aphorisms, and folk wisdom.
- Interesting questions that have arisen when you have taught or studied this content.

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MODULE 17

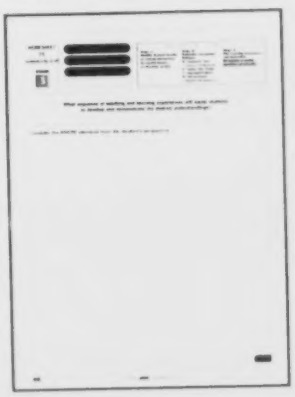
TEACHING APPROACHES

At its most basic, teaching for understanding means, ironically, less teaching. Much of understanding is about thoughtfulness, and thoughtfulness is awakened more than trained—developed by design, not exhortation. When educators teach for understanding, students must come to see that understanding means that they *must figure things out, not simply wait for and write down teacher explanations. To understand complex ideas, the learner—not the teacher—must make meaning of ideas.*

USING THE MODULE

The backward approach to design suspends instructional planning—the development of specific lessons and selection of teaching strategies—until the last phase of the process. Until teachers have specified the targeted understanding, the assessment tasks, and the enabling knowledge and skill necessary to master such tasks and display understandings, a discussion of learning activities and teaching strategy is premature. Teaching "moves" must be made in light of established goals and what they require.

Worksheet 3.6



We begin by considering the requirements for instruction implied in the design. Given the objectives (as mapped out in an assessment plan) and a curricular plan, what kinds of teaching need to take place? First, let's note all the possible teaching moves one *might* make, given the goal of student understanding. We have found it helpful to list those moves under the three broad categories of teaching types originally proposed by Adler (1982) in *The Paideia Proposal*: didactic (or direct) instruction, coaching of skills, and facilitation, as shown in Figure 17.1. (For further insight on the three teaching types and on what kind of teaching best suits what kind of objective, refer to Adler [1984] and follow-up volumes.)

No single approach is best or preferred to teach for understanding. Particular instructional methods and techniques are selected on the basis of the specific types

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of learning needed to achie e the desired results (evidence of understanding) in a unit or course. Teachers should routinely use all three types of teaching.

Direct instruction is not a second-class form of teaching; it is vital for efficiently and effectively developing enabling skill and knowledge. An education devoted *exclusively* to guided discovery is inefficient and may be ineffective.

To use a real-life example, suppose you get lost while driving and stop to ask for directions from a gas station attendant. You don't want Joe Socrates asking, "And why are you trying to get there as opposed to some other place? What does it mean that you are driving? How do you think you became lost? Have you considered that maybe you are not lost and have found something important?" You want Joe to directly instruct you on how to get to Main Street.

Likewise, if you are learning entry-level computer skills, procedures for library research, or a foreign language, you will probably do best with guided step-by-step instructional coverage and directed skill-building exercises. And trying to get students to discover on their own the "carry" rule in adding large sums can waste much time and effort.

Conversely, overemphasizing didactic teaching bypasses the constructive work students must do to understand what they learn. Rather than succumb to either-or thinking about direct or indirect teaching approaches, as educators, we need to consider more carefully issues of strategy and choice. When should we teach what we know, and when should we structure experiences that cause inquiry and

➤ **MISCONCEPTION ALERT**

We all joke about the teacher who says, "I taught it, but they didn't learn," but classroom observation suggests that we are all prone to such thinking when students don't seem to understand what we're teaching. Teaching for understanding by recipe and recitation does not work. Although we naturally play to our strengths and predilections as teachers, we may have to develop new teaching strategies in the service of the understandings we seek. More opportunities for meaning making and more assessing of student responses are required. The irony is that less teaching can yield better learning if our assignments and assessments are well designed—if we evoke and require understanding rather than only trying to hand it over.

constructive understanding? When should we cover, and when should we uncover? These are the key questions for teachers of understanding.

We should use direct instruction and focused coaching for discrete, unproblematic, and enabling knowledge and skill. We should reserve uncoverage—and the kinds of facilitative or indirect teaching it implies—for those ideas that are subtle; most prone to misunderstanding; and in need of personal inquiry, testing, and verification.

REFLECTION FROM BOB JAMES

Let's consider Bob James's nutrition unit from the vantage point of the three types of teaching.

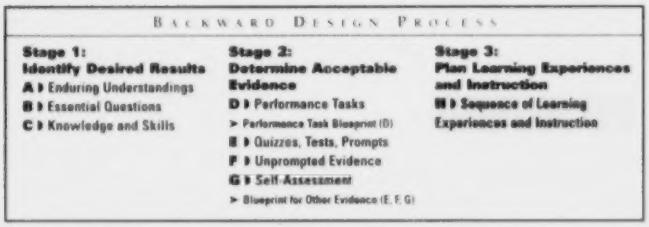
- *Didactic.* I believe that direct instruction, combined with student reading and checks for understanding, is an effective approach to teach factual knowledge about protein, fats, carbohydrates, and cholesterol; the food pyramid; and the relationship among food consumption, caloric intake, and energy expenditure.
- *Coaching.* Coaching comes into play when I provide feedback and guidance to students as they work on their tasks and project.
- *Facilitative.* The unit presents numerous opportunities for guided inquiry and discussions around the essential and entry questions (e.g., What is healthful eating?). Students will also need to engage in individual and group research as they work on their performance tasks.

To develop the prerequisite knowledge and skill, I'll use a blend of teaching methods, including direct instruction, inductive (constructivist) methods, and cooperative group work.

FIGURE 17.1

STAGE 3

TEACHING TYPES


BACKWARD DESIGN PROCESS
Stage 1:
Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills
Stage 2:
Determine Acceptable Evidence
D ▸ Performance Tasks
➤ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➤ Blueprint for Other Evidence (E, F, G)
Stage 3:
Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

What the Teacher Uses	What Students Need to Do
Didactic/Direct Instruction	*Receive, take in, respond:*
Demonstration/modeling	Observe, attempt, practice, refine
Lecture	Listen, watch, take notes, question
Questions/convergent	Answer, give responses
Coaching	*Refine skills, deepen understanding:*
Feedback/conferencing	Listen, consider, practice, retry, refine
Guided practice	Revise, reflect, refine, recycle through
Facilitative/Constructivist/Reflective	*Construct, examine, extend meaning:*
Concept attainment	Compare, induce, define, generalize
Cooperative learning	Collaborate, support others, teach
Discussion	Listen, question, consider, explain
Experimental inquiry	Hypothesize, gather data, analyze
Graphic representation	Visualize, connect, map relationships
Guided inquiry	Question, research, conclude, support
Problem-based learning	Pose/define problems, solve, evaluate
Questions (open ended)	Answer and explain, reflect, rethink
Reciprocal teaching	Clarify, question, predict, teach
Simulation (e.g., mock trial)	Examine, consider, challenge, debate
Socratic seminar	Consider, explain, challenge, justify
Writing process	Brainstorm, organize, draft, revise

Source: Wiggins & McTighe, 1998, p. 160.

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MODULE

18

A Story Structure for Curriculum Design

The most basic feature of all compelling stories is the presence of some mystery or dilemma; we are plopped into a specific world that has to be figured out. Instead of presenting a straightforward sequence of events, the compelling storyteller deliberately raises questions and delays answering them.

—Wiggins & McTighe, 1998, p. 140

USING THE MODULE

The typical organization of curriculum—the scope and sequence—provides a linear march through content topics; it is the logic of detailed and patient explanation (Facet 1). But our theory of understanding suggests that at least two other kinds of logic may often more appropriately organize work for students: the logic of narrative (Facet 2) and the logic of application (Facet 3).

Worksheet 3.6

Both alternative methods are time-honored ways of teaching. But they unfold differently from explaining and analyzing a topic. Stories do not lay out all facts and ideas in a step-by-step fashion. They start in the middle of things, and they often cause one to rethink events and characters as the story progresses. Though seemingly illogical, stories often have an overall flow, drama, and coherence that make them easier to grasp than material presented in the didactic-catalog fashion of textbooks.

Facet 2 (interpretation), as well as common sense, suggests that a curriculum grounded in the structure and logic of stories offers the potential for more engagement, more deliberate rethinking (hence deeper understanding), and more coherence in the overall design than does sole use of the logic of explanation. Think of how your syllabus might be designed by Stephen King or Steven Spielberg to move back and forth between provoking thought and resolving questions. Any course

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can be designed to honor this logic. For example, we know of a chemistry course taught entirely as forensics. The usual chemistry course is required to solve crimes, with the teacher staging clues and students solving cases.

To work for an audience, stories have to be engaging and user friendly. Stories need coherence, direction, and flow, or they end up confusing and disengaging. By thinking of backward design as a story, teachers are more likely to avoid the boredom of schooling, the haphazardness of coverage, and the "I taught it, but they didn't get it" syndrome. And because the logic is then conceived to meet a *recipient's* need to be engaged, leading to a slowly emerging understanding with different levels, teachers will be less inclined to think the lessons and their connections are obvious or linear. Stories also invariably make learning easier because memory works better when structured into narrative. (For more information on narrative, see Schank, 1990; Bruner, 1990.)

Thinking of curriculum as narrative helps us see why problem-based learning (PBL) works as an engaging and effective design, even in such abstract disciplines as chemistry and calculus. Immersion in real problems involves the unfolding of a

➤ **MISCONCEPTION ALERT**

Not every unit needs a story with a plot, characters, and suspense. A curriculum is not a story except in a metaphorical sense. Our point in using the metaphor is to encourage designers to consider three elements of good pedagogical design:

- A curriculum designer, like an author or moviemaker, needs to engage students as soon as possible, immersing them in something interesting and important. One needn't have all the facts before confronting challenging ideas, perplexing issues, or challenging problems.
- A unit's sequence should reflect the logic of learning, not merely the logic of the textbook. Coming to understand involves questioning, theory building, trying out, checking, and rethinking. Consider the reader or viewer of a compelling mystery. A march through a dry, straightforward reference book rarely generates or sustains active attempts to uncover.
- Important learnings, whenever possible, should be allowed to unfold and reveal themselves through the work, as opposed to a teacher telling students what they should see as important. Imagine if storytellers stripped a story of its engaging elements and simply told its meaning or moral.

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story. The work of involved students brings the story to fruition or denouement. The students, in effect, become part of the story. PBL works well as a vehicle for developing uncoverage and understanding because its form suits its object. We often understand complex matters through stories, and we often reveal that we understand by our ability to tell meaningful but accessible stories.

Thus far, we have suggested the value of thinking metaphorically about a unit as a story in order to consider the engagement and flow from a student's perspective. In fact, some teachers have found that actually employing a story structure to plan the unfolding of a unit is beneficial. Worksheet 18.1 provides a framework for such an approach. Figure 18.1 is an example of the story structure "in action" for an ecosystems unit.

REFLECTION FROM BOB JAMES

Although I've never thought of a curriculum unit as a story, I am really attracted to the idea, perhaps because I'm such a film buff and appreciate how a good cinematic story can enthrall the viewer. I guess that my hook—beginning the unit with the sailors' mystery disease—is storylike. I'm already thinking about an upcoming social studies unit on westward expansion that would lend itself to this type of organizing frame.

FIGURE 18.1

Corresponds to WS 18.1

STAGE 3

USING A STORY STRUCTURE

Ecosystems Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
➤ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

Setting	Where and when does the story take place?	The Chesapeake Bay area: first, in a restaurant overlooking the bay; then, in a science research lab.
Characters	Who are the major and minor characters?	Major characters are family members (father, grandfather, and siblings). Minor characters are researchers and policymakers. Students role-play all characters.
Opening	How will students be drawn into the story (e.g., reader, viewer, or listener)?	The family is ordering dinner at a restaurant. Gramps is angry because his favorite seafood dish—sea trout—is no longer on the menu.
Obstacles or Problems	What problems must be solved? What obstacle needs to be overcome?	Local fisher people report that sea trout are dying in the bay. What is causing this?
Dramatic Tension	What opposing forces are at work (e.g., ideas or characters)?	Farming industry versus fishing industry. Fertilizer and manure runoff from farms is polluting the bay.
Surprises and Twists	What surprises, ironies, twists, and unexpected turns will be built in?	Students learn that the chief polluters are farmers who unknowingly are polluting the bay with runoff from manure and fertilizer. These farmers include the kids' own father and grandfather!
Resolution or Solution	How are obstacles overcome? How is the problem solved? How does the story end? What might the sequel be?	Now that the causes and effects are known, researchers and policymakers develop nonpolluting farming methods.

Source: The story is from a middle school science unit developed at the College of William and Mary, Center for Gifted Education (1997).

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WORKSHEET 18.1

Corresponds to Fig. 18.1

STAGE 3

USING A

STORY

STRUCTURE

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction

Setting	Where and when does the story take place?
Characters	Who are the major and minor characters?
Opening	How will students be drawn into the story (e.g., reader, viewer, or listener)?
Obstacles or Problems	What problems must be solved? What obstacle needs to be overcome?
Dramatic Tension	What opposing forces are at work (e.g., ideas or characters)?
Surprises and Twists	What surprises, ironies, twists, and unexpected turns will be built in?
Resolution or Solution	How are obstacles overcome? How is the problem solved? How does the story end? What might the sequel be?

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MODULE 19

CURRICULUM AS TASK ANALYSIS

If understanding is ultimately about the performances and insights that come from creating, adapting, critiquing, and applying knowledge, then the logic of learning needs to be more like the sequence we experience in ski classes than in most math classes. Focus from the start on a target performance, start with the most simple and scaffolded ways of doing the performance, and slowly introduce more complexity amid ongoing attempts to grapple with key questions and performance challenges.

USING THE MODULE

Task analysis derives its sequence from specific performance standards and needs. As coaches, we organize a sequence backward from specific tasks and standards. Lessons are derived from the desired results, based on building up performance skill and knowledge. Here Whitehead's (1929) maxim of "get your knowledge and use it quickly" applies. We head right to the desired performance, even if it has to be simplified or scaffolded (e.g., T-ball for 6-year-olds); we build up performance progressively; and we revisit the fundamentals as needed. Ski classes no longer require beginners to learn snowplows, stem christies, and other overly analytical approaches to building up performance. Instead, learners start to parallel ski, using short skis and no poles. Similarly, software manufacturers now provide tutorials and usage ideas in brief manuals, separate from a complete reference manual organized analytically into topics.

Coaches invariably revisit the basics with each new group, no matter how expert a student is—how to hold an instrument, how to pass and shoot, how to sing from the diaphragm and not the throat. They do not think of this as time lost or coverage sacrificed because they know they will gain better results. And they will go into greater depth on the basics with more advanced students.

Even when practice is devoted to topics in sequence, good coaches never front-load all important information before a practice or performance. They understand

Worksheet 3.6

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that two kinds of learning by doing must keep occurring. Students must practice the new ideas in simplified drill or exercise form, and they must then practice using those discrete skills or moves in a more complex and fluid performance. Didactic teaching occurs while students play and after they play, as a way of making the learning by doing more self-conscious and informed. Coaches don't say, "We covered defense last year; this year, we'll work on offense." The logic is iterative, not linear, and focused on specific performances that integrate knowledge and skill, not coverage.

The movement back and forth, from discrete learning to whole performance, from part to whole to part and back to whole again, is a familiar one to all performers in writing, the performing arts, and athletics. In acting, we rehearse a few lines of dialogue, then put them back into act 2, scene 4, and rehearse again as needed. In writing, we fine-tune our story introductions, read the whole story to see if it works, then have the work peer edited. Alas, the introduction confuses the reader, so we work on it again. In basketball, we practice shooting and dribbling in isolation, work on drills that combine the two, then have a controlled scrimmage to see if we can put everything together in context. On the basis of feedback from results in the whole performance, we go back to drillwork to overcome misunderstandings, bad habits, or forgotten lessons. Work on specific elements, chunks of performance, and performance as a whole constantly recycles. The work is structured as many sequences of model, practice, feedback, practice, perform, and feedback—followed by more such loops as the complexity of each exercise increases toward the complexity of the whole performance.

Your emerging design requires task analysis. The goal is a filled-out template to use for classroom performance. Mindful of the template demands, a teacher-designer maps back from the desired result of a complete unit to the present to determine the best way to reach the goal. The process is iterative, not linear. Filling out the template requires ongoing analysis, not blindly following a recipe.

A flowchart is a time-honored tool for performing such a task analysis. Two examples are provided to show how thinking backward from a final result enables a teacher to develop a more logical plan. Figure 19.1 shows how a task analysis chart is used for preparing a Thanksgiving meal for a family; Figure 19.2, for planning a Russian history unit based on a culminating performance.

MISCONCEPTION ALERT

The word *task* in "task analysis" does not necessarily refer to performance tasks. We use the phrase to mean any decision-making process in which the steps needed to accomplish an end result are derived from that end result. To design a curriculum as a task analysis is to design actions backward, from a given target. Thus, even if a unit culminates in a conventional set of exam questions, teachers would still ask, What must the teaching and learning be to enable students to do well on the final exam?

The purpose in using the phrase is to alert teachers to think beyond mere coverage and activities, to focus their designs on leading students to perform well certain important actions—tasks in a broad sense. Such a goal tends not only to make learning more active and focused but also to appropriately alter the sequence of teaching and learning activities to make sure students are properly equipped for such tasks. Used in this sense, task analysis means the kind of curriculums found in team sports or the performing arts.

REFLECTION FROM BOB JAMES

Task analysis makes sense to me. It reminds me of the old "behavioral objectives" days. But the one thing that I never liked about it then—the focus on very low-level and discrete goals—is solved by designing backward from complex performance tasks. It just makes sense to derive lessons from what students need to perform (rather than simply following the sequence of the textbook).

My neighbor teaches at the regional vo-tech high school, and from what he's told me, their competency-based curriculum is planned this way. Teachers present students with performance goals, such as building a house or rebuilding an engine, and all the teaching and learning experiences are structured and sequenced to accomplish the targeted task. It's what I already do when I coach boys' soccer: I make up my practices on the basis of our goals for the upcoming game and performances in previous games.

As I think about it, task analysis can help me sharpen the sequence and content of the nutrition unit once I flesh out the details of my camp menu and brochure tasks. I realize that I have tended to teach the unit by following the pagination of the textbook rather than through thinking backward from final performance requirements. Ah, more food for thought.

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FIGURE 19.1

STAGE 3

Using a Flow Chart for Task Analysis

Thanksgiving Meal

Backward Design Process

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ➤ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction

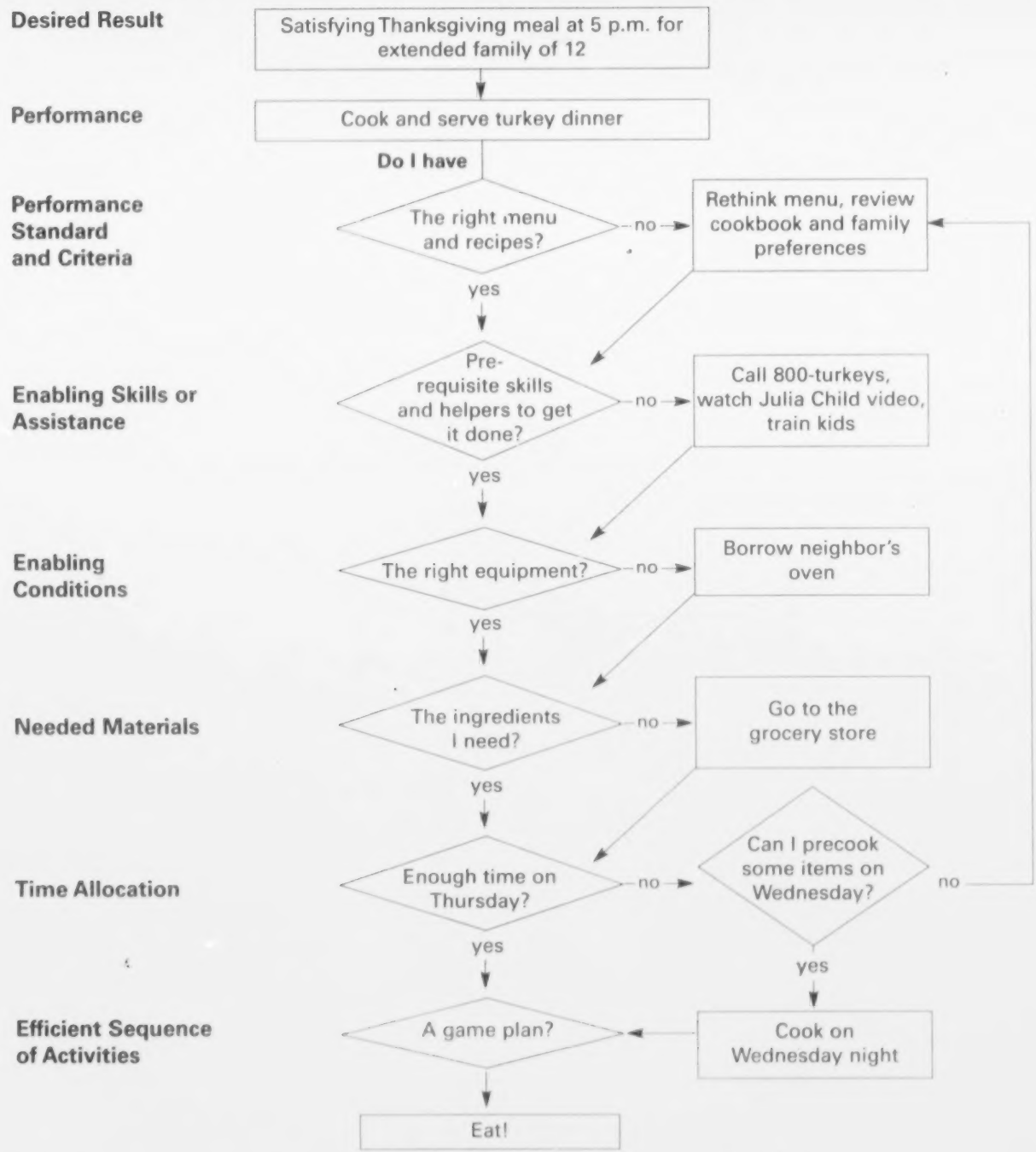

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FIGURE 19.2

USING A FLOW CHART FOR TASK ANALYSIS

STAGE 3

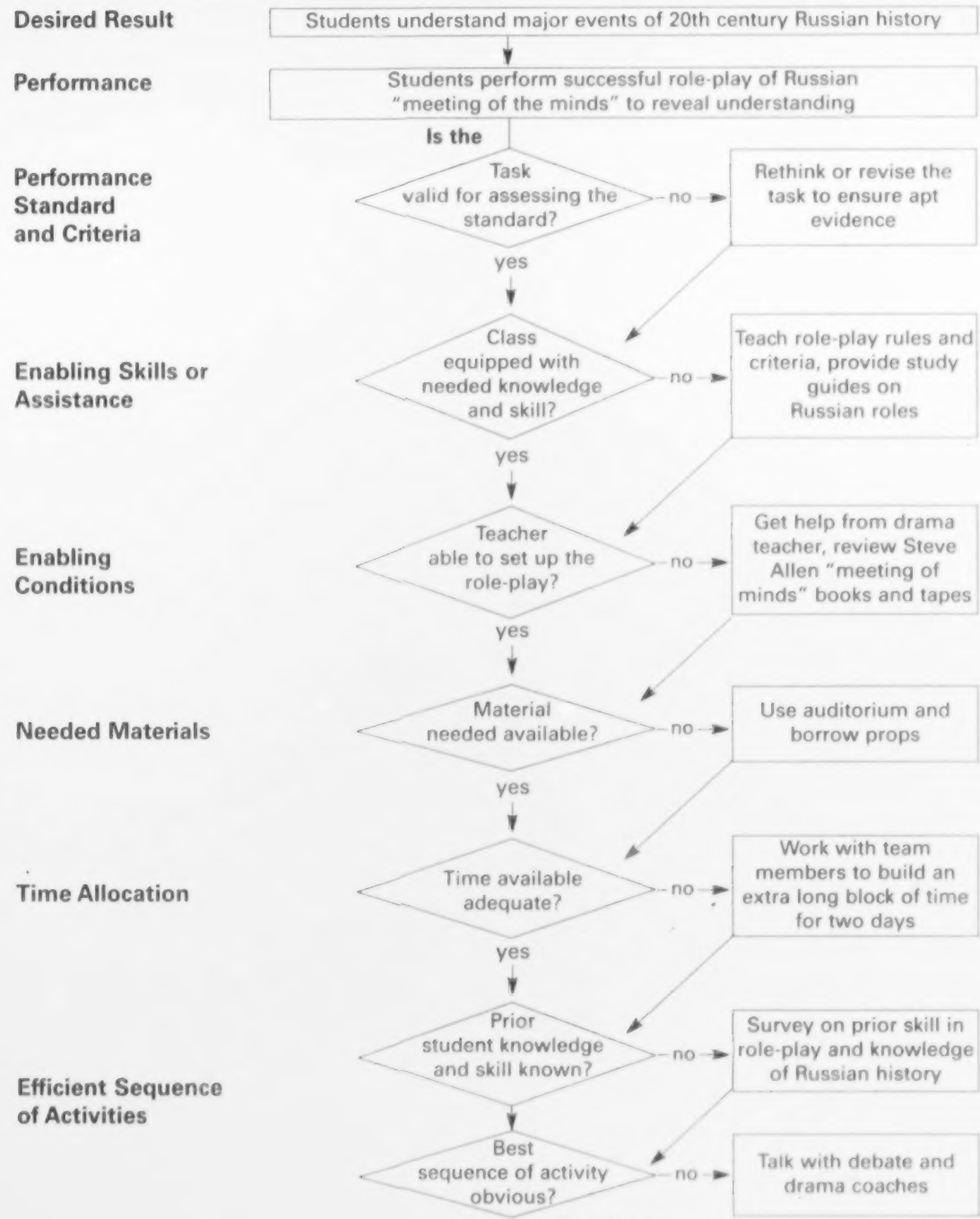
Russian History Unit

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
- B ▸ Essential Questions
- C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- D ▸ Performance Tasks
  - ▸ Performance Task Blueprint (D)
- E ▸ Quizzes, Tests, Prompts
- F ▸ Unprompted Evidence
- G ▸ Self-Assessment
  - ▸ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction


Desired Result
Students understand major events of 20th century Russian history
Performance
Students perform successful role-play of Russian "meeting of the minds" to reveal understanding
Is the
Performance Standard and Criteria
Task valid for assessing the standard?
no
Rethink or revise the task to ensure apt evidence
yes
Enabling Skills or Assistance
Class equipped with needed knowledge and skill?
no
Teach role-play rules and criteria, provide study guides on Russian roles
yes
Enabling Conditions
Teacher able to set up the role-play?
no
Get help from drama teacher, review Steve Allen "meeting of minds" books and tapes
yes
Needed Materials
Material needed available?
no
Use auditorium and borrow props
yes
Time Allocation
Time available adequate?
no
Work with team members to build an extra long block of time for two days
yes
Efficient Sequence of Activities
Prior student knowledge and skill known?
no
Survey on prior skill in role-play and knowledge of Russian history
Best sequence of activity obvious?
no
Talk with debate and drama coaches

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The UNDERSTANDING by DESIGN *Handbook*

TESTING AND PEER REVIEW

Modules 20–21

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ◗ Enduring Understandings
- **B** ◗ Essential Questions
- **C** ◗ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ◗ Performance Tasks
  - ➤ Performance Task Blueprint (D)
- **E** ◗ Quizzes, Tests, Prompts
- **F** ◗ Unprompted Evidence
- **G** ◗ Self-Assessment
  - ➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ◗ Sequence of Learning Experiences and Instruction

MODULE 20

TESTING DESIGNS AGAINST STANDARDS

The design standards serve curriculum designers in the same way that a scoring rubric serves students. When presented to students before they begin their work, the rubric provides them with a performance target by identifying the important qualities toward which they should strive. Similarly, the design standards specify the qualities of effective units according to the Understanding by Design framework (emphasis in original).

—WIGGINS & MCTIGHE, 1998, P. 179

USING THE MODULE

In their design work, educators must practice what they preach to students. Their work, too, is performance based and thus driven by standards. To assist designers in checking *and* improving their work, we have provided 12 design standards corresponding to the three stages of backward design (see Figure 20.1). Each of these standards is accompanied by a detailed test containing criteria, presented in rubric form, to use for self-assessment and peer review.

The tests contribute to design work in three ways:

- *As a reference point during design.* Teachers can periodically check to see, for example, if the identified understandings they initially proposed are truly big and enduring ideas, or if the assessment evidence is sufficient. The criteria contained in the rubrics serve as reminders of important design elements to include, such as a focus on the WHERE elements in Stage 3.
- *For use in self-assessment and peer review of draft designs.* Teachers and peers can use the criteria to examine draft units to identify needed refinements, such as expanding or aligning the assessment evidence.
- *For quality control of completed designs.* The tests can also be used following classroom trials by other teachers and independent reviewers (e.g., curriculum

committees or supervisory personnel) to validate the designs prior to their distribution to other teachers.

Tests 1–3 assess elements in Stage 1 of backward design.

- Test 1 assesses if a proposed understanding is enduring—a big idea or core process at the heart of the discipline (see Figure 20.2).
- Test 2 assesses if a targeted understanding is specific enough to guide instruction and assessment (see Figure 20.3).
- Test 3 assesses if a unit is focused on important and engaging questions (see Figure 20.4).

➤ MISCONCEPTION ALERT

Failure to meet the standards (Level 3 on the tests) does not necessarily signify a lack of understanding or incompetence. Rather, the tests serve as a reminder that backward design is an iterative process. Teachers rarely develop a perfect unit, performance task, or scoring rubric on their initial attempt. They should expect to revise their unit and course designs following self-assessment and peer review against standards, just as they teach student writers to expect to revise early drafts of their writing.

REFLECTION FROM BOB JAMES AFTER USING STAGE 1 TESTS

I have begun to see the importance of clarifying the target, and my essential and unit questions really help me do that. I think they pass the tests!

I was a little disappointed, however, when I first tested my original understanding target; I realized that it reflected Level 2 criteria on the rubric scale rather than Level 3. I now realize that I had been stating my goal as a topic to be understood (e.g., "Students will understand the elements of good nutrition") instead of a specific generalization about those elements.

I think that my planning will be much sharper as I keep the test criteria in mind. (I already see some changes that I will want to make in future units.)

■ ■ ■ ■ ■

Tests 4–6 assess elements in Stage 2 of backward design.

- Test 4 assesses if a proposed performance task provides a valid measure of a targeted understanding (see Figure 20.5).
- Test 5 assesses if a proposed assessment is anchored in a performance task requiring a meaningful, authentic application (see Figure 20.6).
- Test 6 assesses if the proposed assessment evidence is sufficient to support valid inferences about student understanding (see Figure 20.7).

The great challenge in testing an assessment plan for a unit is to check for validity. To ask if an assessment is valid is to ask a question about the appropriateness of the evidence, given the desired understandings in Box A on the template (Worksheet 3.2), or the desired knowledge and skill in Box C. As educators, we want to make sure that the specific answers or performance we get from an assessment is logically connected to the more general understanding we seek to assess.

For example, suppose we want students to understand that the letter of the law and the spirit of the law are different, and that the U.S. federal appeals courts and the U.S. Supreme Court are designed, in part, to help us honor the spirit of the law. What would count as evidence of that understanding? One way would be a task or writing prompt asking students to interpret Supreme Court decisions or to change classroom rules. An assessment that asked students to memorize and recall famous Supreme Court cases, however, would *not* enable us to infer that students understand the difference between the letter and the spirit. On the other hand, if the desired unit goal was knowledge of important Supreme Court decisions, then such a test could provide valid evidence of that knowledge.

Validity also involves the degree to which we can confidently generalize about what a student knows and can do using a sample of evidence as a basis. We want to be able to make fairly sweeping claims about a student's understanding from a small amount of evidence. Not only are we asking, Is that the right kind of evidence? but also, Is the logical jump from this particular task to a more general statement of understanding sound?

A practical way of thinking about the problem of validity is to ask of any proposed performance task, paper-and-pencil test, or oral quiz, Could a student successfully accomplish the task well but lack the desired understanding? and, Could a student perform the task poorly but possess understanding? The goal is always to answer no to both questions—otherwise, the proposed assessment will not provide a valid measure.

Developing valid and reliable performance tasks is one of the most technically demanding parts of Understanding by Design. Few educators have an adequate working understanding of validity, and many of us easily confuse effective hands-on learning activities with valid tests of performance.

Let's look at a completed Performance Task Blueprint to see the problem of validity in action and to understand how to more effectively design an assessment to yield necessary evidence of learning (see Figure 20.8). In a unit on the Civil War, a 5th grade teacher reports that she is going to use a favorite activity to assess one of her state's content standards: "Students will understand the causes and effects of the Civil War." The students are asked to imagine that they are setting up a museum display about the Civil War. They will construct a diorama of a great battle and produce an index card containing detailed information about the battle.

Let's critically examine this performance assessment task by asking the two validity questions mentioned earlier: Could a student successfully accomplish the task well but lack the desired understanding? and, Could a student perform the task poorly but possess understanding? We suspect that evidence from the task will not yield valid inferences about student understanding of the causes and effects of the Civil War. There are two problems. The evidence obtained through the diorama display is not really germane to understanding the causes and effects of the war, and the considerable emphasis on design and display skills has nothing to do with the unit objectives. Filling in the Performance Task Blueprint confirms this suspicion, particularly when we recognize the lack of alignment among the desired understanding (major causes and effects of the Civil War), the proposed task, the specific product (a diorama), and the proposed scoring criteria for the diorama.

Note further that the desired understanding is not yet stated as a full-sentence generalization of what is to be understood, as our approach recommends. Had the designer taken the time to craft complete unit understandings—what *about* the

MISCONCEPTION ALERT

■ The content of a proposed performance task should not be confused with the need for sufficient evidence for *each* student. A task that yields evidence of understanding for some students is insufficient—the task must yield appropriate evidence to judge the understanding of every student.

This problem is often found in assessment tasks that involve students working in cooperative teams or "jigsaw" divisions of labor. The assessments must do more than prove that understanding is distributed around a classroom or in a group. Indeed, the common parental backlash over cooperative projects has little to do with antipathy toward collaborative work and a lot to do with their correct view that assessments and grades should reflect individual contributions and achievements.

■ Authentic tasks should not be confused with hands-on work or performance in a broad sense. Authentic work is a subset of performance; many open-ended performance tasks or writing prompts are not authentic; that is, they are not grounded in realistic problems, audiences, constraints, and purposes that use knowledge. Nonetheless, they may provide valuable evidence of achievement.

■ Validity should not be confused with reliability. Validity concerns the appropriateness of the evidence and the inferences the evidence supports. Reliability concerns the variability of the evidence or whether a clear and defensible pattern to this evidence exists. The two are independent of each other. A valid, authentic task may yield unreliable results. For example, your favorite football team wins its first game of the season. Clearly, the game provides a valid and authentic test; yet we would be hesitant to infer from this one sample that the team will be forever victorious—no pattern has yet emerged. The opening-day win may be an anomaly, and the team loses the rest of its games. Conversely, a student may constantly get the same question about parts of speech wrong on a multiple-choice test, but these "reliable" test scores would not necessarily provide valid predictors of performance in writing essays.

Performance tests are prone to unreliability, even if we value them as more valid measures of important achievement targets. Similarly, we may not value indirect short-answer tests, but their results are often highly reliable and may correlate well with other more valued performances. A balanced blend of methods in assessment is always wise. Such balance and variety is the only way to pass the sufficiency test for the evidence (see Figure 20.7).

causes and effects of the War should students understand?—the validity problem would have been even more clearly revealed. A diorama of a battle, no matter how elegantly designed and well explained, has little relevance to a specific understanding about causality, such as, The Civil War was caused by the different economies and views of government in the North and South.

Does "failing" the validity test mean that this teacher can never use her diorama again? No. If it is an engaging and effective learning activity, it could become a part of the lesson plan summarized in Stage 3. Or, in an art unit, it could be a valid assessment of specific design and display skills. Or, the task could be modified by placing greater emphasis in the instructions on planning museum exhibits that reveal the causes and effects of the Civil War. In other words, a task is not inherently valid or invalid; validity is a function of drawing inferences from the evidence. That evidence comes from a student's response to a task in relation to standards. By changing the standard or adjusting the assessment, the evidence can be made more or less appropriate.

REFLECTION FROM BOB JAMES AFTER USING STAGE 2 TESTS

When I ran my idea for a camp menu plan against the Stage 2 tests, I could see that my assessment plan had two problems. For one thing, I don't have enough information on all the targeted understandings. I won't really know from the menu planning alone if students' food choices reflect a sophisticated and accurate perception of the food pyramid or just plain old common sense. I can see the value of the facets of understanding here. I need the facets to explain and justify students' menu choices, or to analyze the choices others made.

I also need to make sure that I have enough evidence from *each* student because I had originally planned to allow them to work in groups on the camp menu plan. Well, I know I'll be building in quizzes; perhaps that is enough reinforcing evidence. But maybe I can also make sure that the plan is divided into pieces that can be linked to individual student work.

My task is certainly authentic. But realistically, menu planners have to work within a budget, which will surely influence their choices. And menus alone do not reveal whether students understand all the nutrition lessons of the unit. Here is the validity question popping up in a small way. Maybe I'll include some imaginary budget constraints and wholesale food pricing information that I can get from our cafeteria manager. And then I will need to have more focused questions on particular aspects of nutrition—perhaps in a writing prompt or another performance task.

Whew—this is hard work, but I think I'm getting better at assessment planning!

■ ■ ■ ■ ■

Tests 7–12 assess elements in Stage 3 of backward design:

- Test 7 assesses if students know the overall goals of a unit, the reasons they are important, and their performance requirements (see Figure 20.9).
- Test 8 assesses if students are hooked by provocative experiences early in a unit and their interest held throughout (see Figure 20.10).
- Test 9 assesses if students are equipped for their culminating performances (see Figure 20.11).
- Test 10 assesses if students are provided with opportunities to rethink key ideas and revise their work based on feedback (see Figure 20.12).
- Test 11 assesses if students are provided with opportunities to evaluate their work and consider next steps (see Figure 20.13).
- Test 12 assesses if a unit is coherent from the students' perspective (see Figure 20.14).

MISCONCEPTION ALERT

To assume that WHERE specifies the proper sequence of lessons is a misconception (i.e., that the first lessons must establish students' obligations, the next lesson must provide a hook, and so forth). WHERE simply establishes a set of criteria for judging an instructional plan, not a teaching sequence. Just as an essay can be effective regardless of whether it is constructed using the five-paragraph form, so too, can units meet design standards through many different sequences. The proper way to consider WHERE is to ask, Irrespective of how the unit sequence is constructed, can each element from WHERE be found in the final design?

If, however, the design seems to lack a logical flow or integrity, then the reviewer should question the *coherence* of the unit (see Figure 20.14).

REFLECTION FROM BOB JAMES AFTER USING STAGE 3 TESTS

I think my design passes the WHERE tests pretty well. I have developed a plan that hooks and equips the students. They will have to rethink and evaluate their understandings to complete the final tasks. I think my biggest need is to include a minilesson on brochures and the standards by which they are judged. Maybe I can invite Sue Haverford, who teaches graphics design, to share some design principles and professional brochures with the class. I know they'd love seeing her work. She could also guide the students in generating a rubric to use in evaluating their brochures.

FIGURE 20.1

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

How will we judge our unit designs?

		extensively	somewhat	minimally
	Stage 1: Identify Desired Results			
	To what extent are the targeted understandings			
	1. Enduring (transferable, big ideas at the heart of the discipline) and in need of uncoverage?	❑	❑	❑
	2. Framed as generalizations specific enough to guide teaching and assessing but overarching enough to enable transfer?	❑	❑	❑
	3. Framed by provocative essential questions?	❑	❑	❑
	Stage 2: Determine Acceptable Evidence			
	To what extent do the assessments provide			
	4. Valid and reliable measures of the targeted understandings?	❑	❑	❑
	5. Opportunities for students to exhibit their understanding through authentic performance tasks?	❑	❑	❑
	6. Sufficient and varied information to support inferences about *each* student's understanding?	❑	❑	❑
	Stage 3: Plan Learning Experiences and Instruction			
	To what extent will			
W	7. Students know *where* they are going; *why* (reason for learning the unit content); *what* they already know (prior knowledge); *where* they might go astray (likely misunderstandings); and *what* is required of them (unit goal, performance requirements, and evaluative criteria)?	❑	❑	❑
H	8. Students be *hooked*—engaged in digging into the big ideas (through inquiry, research, problem solving, and experimentation)?	❑	❑	❑
E	9. Students *explore* and *experience* key ideas and receive instruction to *equip* them for the required performance?	❑	❑	❑
R	10. Students be challenged to *rethink* ideas and have opportunities to *rehearse* and *revise* their work based on timely feedback?	❑	❑	❑
E	11. Students *evaluate* (self-assess and set future goals) prior to the conclusion of the unit?	❑	❑	❑
	12. The unit appear coherent to students?	❑	❑	❑

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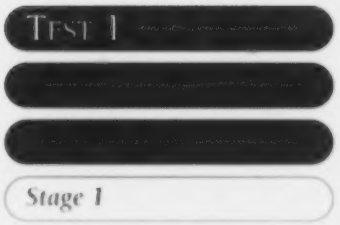
FIGURE 20.2



BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- A ▸ Enduring Understandings
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  - ▸ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- H ▸ Sequence of Learning Experiences and Instruction

Is the proposed understanding truly enduring—a big idea or core process at the heart of the discipline?

Level 3 The understanding is a big idea or core process at the heart of the discipline.

Level 2 The understanding is important but not of the highest priority; or it may be more accurately described as important knowledge and skill (i.e., understand how to design and de-bug an experiment); or both.

Level 1 The understanding as stated is a straightforward fact, skill, or attitude, not a big idea or core process at the heart of the discipline (worth being familiar with, but not the highest priority of importance for an entire course of study).

Example 1

Level 3 Understand that accurate time keeping aboard ships is needed for safe sea exploration to calculate longitude precisely.

Level 2 Understand how to calculate longitude and latitude using a map, sextant, and clock.

Level 1 Define and locate lines of latitude and longitude.

Example 2

Level 3 Understand that essay writing is iterative, not linear; why and how various techniques (e.g., imagining a reader's response and objections, and concept webs) work; and the benefits of drafts, critiques, and revision for achieving more persuasive arguments.

Level 2 Understand how to write a five-paragraph essay.

Level 1 Understand (describe or define) the difference between an essay and a narrative.

Indicators of an enduring understanding

- If the length of your syllabus or program were cut in half, you would still want students to explore the understanding in some depth.
- The understanding is key to connecting and making sense of much discrete knowledge.
- The understanding is key to understanding other important ideas.
- The understanding is unlikely to be fully understood by studying it once.
- The understanding is unlikely to be understood through textbook accounts only.
- There are different ways to study the understanding, teach it, and apply it.
- The understanding is not obvious and is often misunderstood, but it is worth the trouble.
- The understanding involves the kind of problems, challenges, and work that adults do.

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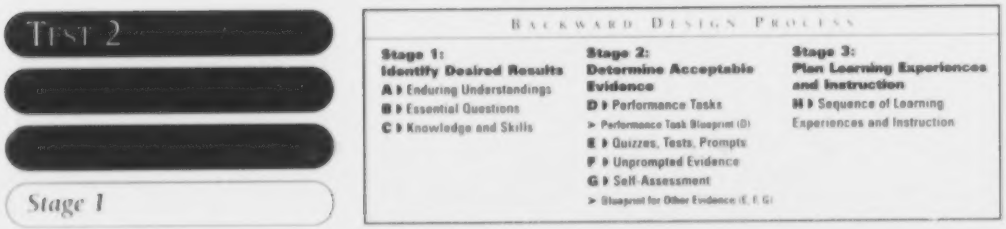
FIGURE 20.3



Is the proposed target a specific matter of understanding?

Level 3 The targeted understanding is stated clearly and specifically. It is framed as a generalization ("specific abstraction"), which specifies the big idea that students should understand.

Level 2 The unit's content focus is clear, but the targeted understanding is vague. An area of study or general understanding may be given, but the specific understanding that should result for students is not stated.

Level 1 The targeted understanding is stated as a general topic or area of study, without stating exactly *what* is to be understood about that topic. The understanding is too vague or general to guide instruction and assessment

Example

Level 3 Understand the causes and effects of the Civil War. Understand
- Why the Civil War was fought over states' rights (not just slavery), and that the issues persist today (e.g., debates over the federal role in education and welfare)
- Why the conflict was inevitable, given the different economies and cultures of the North and the South

Level 2 Understand the causes and effects of the Civil War.

Level 1 Understand the Civil War.

Indicators that a targeted understanding is *not* specific enough

- If teachers cannot agree on exactly what is to be taught or emphasized in the unit.
- If teachers cannot agree on what should be assessed.
- If students and parents cannot tell from the course or unit description exactly what is to be learned and how success will be determined.
- If students do not know what to focus on in their study or how to study it.

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FIGURE 20.4

TEST 3

Stage 1

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ➢ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

Is the unit focused on important and engaging questions?

Level 3 The essential questions are important and thought provoking. They have more than one correct answer and require inquiry rather than recall. They have great potential for engaging students. They provide a unifying focus to guide teaching and learning.

Level 2 The essential questions are appropriate for the topic but do not focus on the most important ideas or core processes. Although they do not have a single correct answer, they may not require much inquiry. They may or may not engage students.

Level 1 The essential questions do not focus on big ideas or core processes. They are not particularly thought provoking and are not likely to engage students. They may have only one correct answer and be too narrow to guide the unit.

Example

Level 3 Can individual liberties and the common good be balanced?

Level 2 How does the U.S. Constitution protect individual liberties and human rights? Why has the Constitution been changed?

Level 1 What are the first ten Amendments to the U.S. Constitution?

Indicators of effective essential questions

- The questions do not yield a pat answer. Rather, they uncover provocative aspects of the topic and guide further inquiry into the unit's big ideas.
- The questions recur; they can be fruitfully asked and explored again and again.
- The questions stimulate other important questions about the unit topic (and beyond).
- Students are engaged in attempting to answer the questions.

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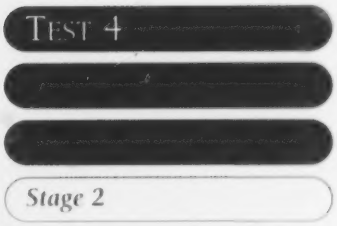
FIGURE 20.5



BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
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▸ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

Would the proposed performance task provide a valid measure of the targeted understanding?

Level 3 The task clearly provides a valid measure of the targeted understanding. Students are required to demonstrate the desired understanding to successfully complete the task.

Level 2 The task likely provides a valid measure of the targeted understanding. Some students, however, may be able to complete the task without demonstrating the desired understanding. (For example, a task involving oral presentation could favor students with strong public speaking skills.)

Level 1 The task does not provide a valid measure of the targeted understanding. Students are not required to demonstrate the desired understanding to successfully complete the task.

Examples from three subject areas

Level 3 Assume the role of a Russian leader in a meeting-of-the-minds simulation; write an editorial and news article explaining the collapse of the Soviet Empire. (The task assesses understanding of mid-to-late 20th century Russian history.)

Level 2 Given a budget, complete a mail-order clothing catalog order form to purchase a back-to-school wardrobe. (The task assesses computation and estimation.)

Level 1 Build a diorama of a Civil War battle. (The task assesses understanding of the causes and effects of the Civil War.)

Indicators of valid performance tasks

- The task can only be accomplished well by students who have the desired understanding, not just some other performance skill.
- The task will be performed poorly by students who lack the desired understanding.
- The task calls for students to thoughtfully apply their understanding. It requires flexibility and good judgment as opposed to plugging information into a formula.

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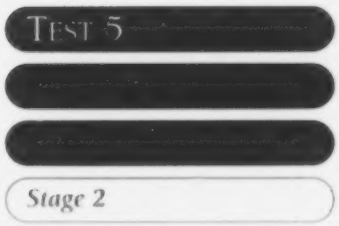
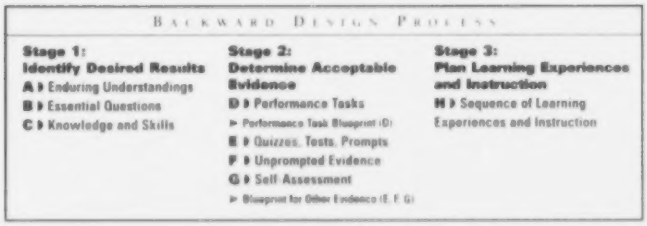
FIGURE 20.6




BACKWARD DESIGN PROCESS
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Stage 3:
Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

Is the assessment anchored in a performance task requiring a meaningful, authentic application of understanding?

Level 3 The task is highly authentic, involving a direct or simulated application of the targeted understanding. The task is complex and involves the types of challenges or constraints that adults face in the world beyond a classroom. Students develop actual products or performances for an identified audience/client.

Level 2 The task calls for applying the targeted understanding, but the context is not particularly authentic. Students may develop actual products or performances, but the task lacks an identified purpose, audience/client, or realistic constraints.

Level 1 The task is inauthentic. It presents an out-of-context question or problem that does not represent the kinds of complexities or challenges adults face. Students may respond to questions but do not develop actual products or performances. No clearly identified purpose, realistic situation, or audience/client is evident.

Indicators of an authentic performance task

- The task represents the kind of challenges adults face in the world beyond a classroom.
- The task requires using a repertoire of knowledge and skill to accomplish the goal or solve the problem.
- The task requires thoughtfully applying knowledge, rather than simply recalling facts or plugging in a formula.
- The task is open-ended. It does not have a single right answer or solution path.
- The task calls for developing a tangible product or performance.
- The task has an identified purpose and audience/client.
- The task involves a realistic scenario.

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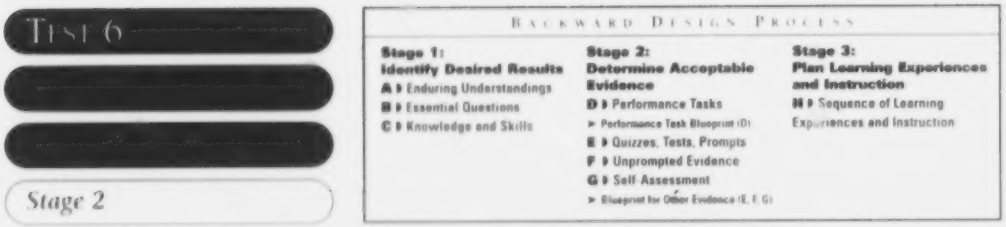
FIGURE 20.7



Is the proposed assessment evidence sufficient to support valid and reliable inferences about student understanding?

Level 3 The proposed assessments provide sufficient evidence to permit confident inferences about each student's overall understanding. Appropriate diversity is evident in the assessment methods; students have many opportunities to reveal the depth and breadth of their understanding, not just a one-time, one-type test or performance task.

Level 2 The proposed assessments provide evidence but are incomplete. Overreliance on one assessment method (e.g., multiple choice) occurs; or several assessment methods are used, but they yield insufficient data to permit confident inferences about each student's overall understanding.

Level 1 The proposed assessments are too limited or incomplete to permit confident inferences about each student's overall understanding.

Indicators of *insufficient* evidence

- A single performance task is required, and it provides evidence about only one aspect of the topic, leaving other important understandings unexamined.
- Evidence types are not balanced (e.g., selected response only).
- Students or parents protest that the final assessment does not accurately reflect what is important in the unit.
- Overreliance on questions of fact and skill occur, and not enough evidence on using that knowledge and skill to reveal understanding is given.

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FIGURE 20.8

Corresponds to WS 3.4

PERFORMANCE TASK BLUEPRINT

Example of a Validity Problem

BACKWARD DESIGN PROCESS		
Stage 1: Identify Desired Results	**Stage 2: Determine Acceptable Evidence**	**Stage 3: Plan Learning Experiences and Instruction**
A ▸ Enduring Understandings	**D** ▸ Performance Tasks	**H** ▸ Sequence of Learning Experiences and Instruction
B ▸ Essential Questions	➢ Performance Task Blueprint (D)	
C ▸ Knowledge and Skills	**E** ▸ Quizzes, Tests, Prompts	
	F ▸ Unprompted Evidence	
	G ▸ Self-Assessment	
	➢ Blueprint for Other Evidence (E, F, G)	

Task Title: Was the Civil War civil? Approximate Time Frame: two periods (plus out-of-class work)

What desired understandings/content standards will be assessed through this task?

Social Studies Students will understand the causes and effects of the Civil War.	Social Studies Students will demonstrate knowledge of topographical maps.	

What is the purpose of this assessment task? ❑ Formative ❑ Summative

Through what authentic performance task will students demonstrate understanding?

Task Overview (include GRASPS: goal, role, audience, situation, product or performance, and standards)

You are opening a new museum on the Civil War. The museum is designed to inform and engage young people. Select a decisive Civil War battle, research the battle, and construct a diorama of the battle. Attach an index card to your diorama, containing the battle's date, names of the opposing generals, number of casualties on each side, and the victor. Finally, create a topographical map to show an aerial view of the battlefield.

Remember: Your map must be drawn to scale. Neatness and spelling count!

What student products/performances will provide evidence of desired understandings?

Diorama of a Civil War battle	Topographical map of a battlefield	

By what criteria will student products/performances be evaluated?

- Actual Civil War battle is depicted.
- Information is accurate on index card.
- Diorama is neat and colorful.
- Spelling is correct.
- Typography is accurate.
- Map is drawn to scale.
- Map includes compass rose.
- Armies are correctly placed.

What type of scoring tools will be used for evaluation? (Use a separate sheet for scoring tools.)

❑ Analytic rubric ❑ Holistic rubric ❑ Criterion (performance) list ❑ Checklist

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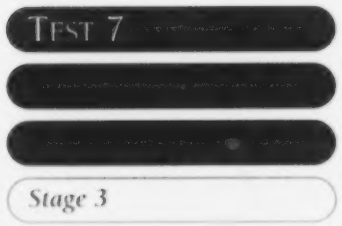
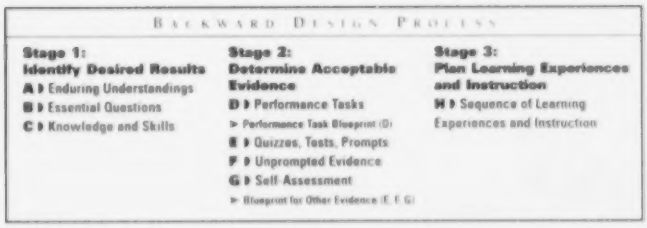
FIGURE 20.9




BACKWARD DESIGN PROCESS
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Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

Do students know what the overall unit goal is, what is most important and why, what the performance requirements are, and what criteria or standards will be used to assess their work?

Level 3 The unfolding of the first few lessons reveals where the unit is headed. Students clearly know the unit goals, as well as the tasks, criteria, and standards by which their understanding will be determined. They are fully mindful of the priorities—what is most important and why.

Level 2 Students are not completely clear about the unit goals or about the tasks, criteria, and standards by which their understanding will be determined. They are somewhat mindful of the priorities—what is most important and why.

Level 1 Students are unclear about what they are to do and why. They have little sense of the unit priorities. They do not understand the tasks, criteria, and standards by which their understanding will be determined until it is too late.

Indicators that students are likely to understand where the unit is headed

- Students do not ask questions about where the lessons are headed.
- Students can articulate the unit priorities—what is most important and why.
- Students know what to study and how to prepare for the culminating assessments.
- Students propose alternative ways to demonstrate their understanding.
- Peer reviewers do not see where the unit is headed.

Indicators that students do *not* likely understand where the unit is headed

- Students ask these questions:
  - Why are we doing this? Where is the unit headed?
  - Does this count? How am I doing? How does this relate to ____?
  - Is this right? Is this what you want?
- Students do not know what to do to prepare for the culminating assessments.

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FIGURE 20.10

TEST 8 [redacted]

Stage 3

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
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G ▸ Self-Assessment
➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

Are provocative introductory experiences provided early in the unit, and is student interest likely to be held as the unit unfolds?

Level 3 The unit has a powerful hook stimulated by thought-provoking experiences early on. Students will likely pay more attention than usual and take a greater interest than usual in complex ideas. They are likely to be so engaged (or puzzled) by the opening activities that they want to know more about the unit's big ideas. The unit's unfolding maintains heightened interest.

Level 2 A clear attempt to hook students with a thought-provoking and accessible entry to the topic is evident, but the attempt is either too oriented toward adult interests or the hook is too tangential to the unit's big ideas; or the opening hook is creative and provocative, but the unit is not likely to sustain student interest; or both.

Level 1 The opening lessons have little to hook students. Students do not display a heightened interest in the unit's ideas. The unit unfolds in a typically linear and predictable manner.

Indicators that the unit has a powerful hook for students and holds their interest

- The unit addresses an engaging issue, problem, or puzzle for students of this age.
- The unit has a refreshing lack of predictability as it opens and unfolds.
- The unit's work provides a provocative mystery or counterintuitive elements to cause initial wonder and sustained engagement.
- The unit is likely to generate more discussion, argument, and proposed investigations from students than usual.

Indicators that the unit does *not* have a hook for students

- Too much information is front-loaded.
- The unit has an overly academic entry to the topic and a highly predictable unfolding (such as beginning with the next chapter in the textbook).
- The unit begins with what appears to be a transparent attempt or irrelevant trick to make students more attentive.

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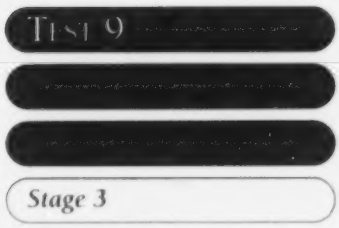
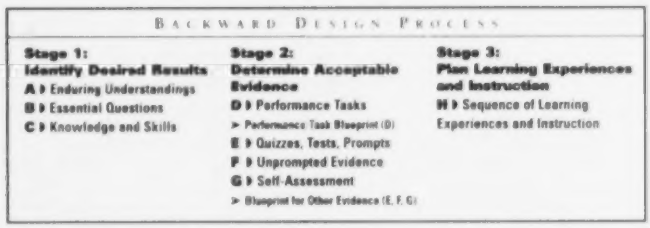
FIGURE 20.11




Backward Design Process
Stage 1:
Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills
Stage 2:
Determine Acceptable Evidence
D ▸ Performance Tasks
➢ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➢ Blueprint for Other Evidence (E, F, G)
Stage 3:
Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

Are students equipped to demonstrate understanding through their culminating performances? Are students provided with experiences to help them explore key ideas?

Level 3 The unit moves beyond the facts to fully explore key ideas through illuminating experiences. Lessons and activities equip students to effectively prepare for their final performance tasks to demonstrate the targeted understandings.

Level 2 The unit's key ideas are treated somewhat superficially (e.g., in textbook-driven ways); or lessons and activities do not thoroughly prepare students for all that the final performance tasks demand; or both.

Level 1 The unit does not go beyond a superficial or abstract treatment of the topic, which is sufficient only for an assessment of recall; or the unit does not adequately prepare students for the final performance tasks; or both.

Indicators that the unit will adequately equip students

- The textbook is treated as a resource for inquiry, not as a complete syllabus.
- Students are instructed and coached in important procedural and strategic abilities required by the culminating performance tasks (e.g., instruction and coaching in basic debate skills before a class debate).
- Students are given ample opportunity to practice or rehearse for the final performances.

Indicators that the unit will *not* adequately equip students or allow in-depth exploration of the big ideas

- The textbook seems to be the only source of content to be understood. The unit design allows for little or no inquiry, exploration, or questioning.
- The unit design assumes students have all needed performance skills.
- Students do not have adequate time to practice or rehearse.

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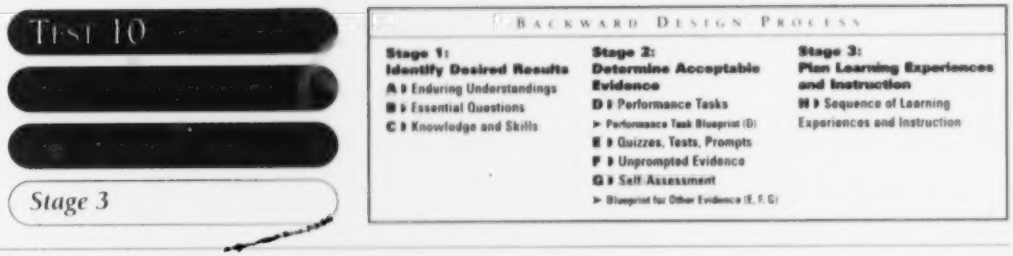
FIGURE 20.12



Are students provided with opportunities to rethink key ideas and revise their work based on feedback?

Level 3 The unit is clearly built in an iterative way, requiring students to rethink key ideas as further learning and inquiry occur. The unit has built-in opportunities to revise work or performance in progress on the basis of feedback or unexpected results. The culminating products and performances reveal deeper understanding as a result of rethinking and revising.

Level 2 The unit may ask students to consider different points of view or strategies of performance throughout, but the unit does not require much rethinking and revision. Opportunities to get and use feedback to rethink and refine may occur, but they may be optional, not integral to the unit design.

Level 1 The unit provides only a linear march through content, requiring students to merely give back what was taught. The big ideas are made to seem straightforward and unproblematic; hence, no rethinking is needed. Opportunities to revise work are inadequate or nonexistent.

Indicators that the unit will require appropriate rethinking, rehearsal, or revision

- Later activities and inquiries are likely to cause students to realize, without the teacher saying so, that earlier views need to be rethought or revised.
- The unit design allows students to view the same ideas from different perspectives.
- Students must construct and test some key theories or answers inductively.
- Students self-assess their work or assess peer work, and self-adjustment is required before the final performances.
- Students must keep confronting the same recurring questions in their work.

Indicators that the unit will *not* require much rethinking, rehearsal, or revision

- The lessons and their sequence mirror the paging of the textbook.
- The work primarily demands a plugging-in of knowledge and skill as opposed to a questioning of what is being learned.
- The unit does not provide opportunities for ongoing self-assessment and self-adjustment.

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FIGURE 20.13

TEST 11

Stage 3

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results	Stage 2: Determine Acceptable Evidence	Stage 3: Plan Learning Experiences and Instruction
A ▸ Enduring Understandings B ▸ Essential Questions C ▸ Knowledge and Skill's	D ▸ Performance Tasks ➢ Performance Task Blueprint (D) E ▸ Quizzes, Tests, Prompts F ▸ Unprompted Evidence G ▸ Self-Assessment ➢ Blueprint for Other Evidence (E, F, G)	H ▸ Sequence of Learning Experiences and Instruction

Are students provided with opportunities to evaluate their work and consider next steps?

Level 3 The unit culminates by providing students with opportunities to consider the quality of their work, the value and meaning of the unit, and plans for logical next steps (e.g., pursue the issues raised in the unit or identify needed skill development).

Level 2 The unit culminates by providing students with an opportunity to make a final self-assessment, but larger questions about the meaning of the work and possible plans for future inquiry and skill development are not addressed.

Level 1 The unit ends with no formal opportunity for self-assessment and future planning.

Indicators that the unit provides adequate opportunities for self-assessment

- At least an entire lesson addresses the questions, So what? and, Now what?
- Students are required to make an improvement plan as a result of the unit, and the curriculum allows them to act on that plan.

Indicators that the unit does *not* provide adequate opportunities for self-assessment

- The unit ends on the day of the test.
- Students are not required to formally self-assess their work in the unit.
- The course moves on, irrespective of results.

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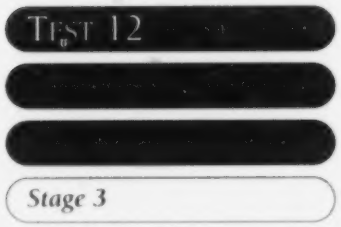
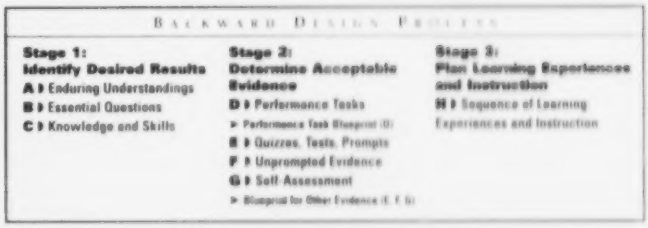
FIGURE 20.14




Backward Design Process
Stage 1:
Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
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H ▸ Sequence of Learning Experiences and Instruction

Is the unit logical and coherent from the students' perspective?

Level 3 Students see the logic of the unit—how the lessons and activities are connected and flow together. They understand that the unit is clearly focused on big ideas, overarching questions, and appropriate culminating performance tasks. Most students know clearly what is most important and how the lessons and activities are directed toward important ideas or culminating performance tasks.

Level 2 The sequence of lessons and activities is likely to be somewhat illogical to the students, even though the sequence might make sense from an adult's point of view. The lessons may be logically sequenced, but no clear or explicit relation to the overarching understandings and culminating performance tasks is evident. Students are not always clear about what is most important or why they are doing what they are doing.

Level 1 The sequence of lessons and activities is likely to be confusing, incomplete, or illogical to the students. Lessons and activities seem strung together in a disconnected fashion—not heading toward a synthesis of important ideas or culminating performance tasks. Most students have no clear idea of what is most important or why they are doing what they are doing.

Indicators that the unit design lacks coherence from the students' perspective

- Most students exhibit passive or aimless behavior.
- The teacher regularly hears, Why are we doing this?
- Students seem unprepared for and surprised by final performance tasks.
- The logic of the unit does not seem to tell an unfolding story or to be mindful of the need to make students feel competent and goal directed.
- The unit seems driven more by the goal of coverage than by the students' needs to make sense of and use the content in meaningful ways.

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MODULE

21

PEER REVIEW

Our profession rarely subjects teacher-designed units and assessments to this level of critical review. Nonetheless, we have found structured peer reviews, guided by design standards, to be enormously beneficial—to both teachers and their designs.

—WIGGINS & MCTIGHE, 1998, P. 179

USING THE MODULE

The primary purpose of peer review is to provide feedback to designers to help them improve their unit designs. There are also residual benefits. Participants in peer review sessions regularly comment on the value of the opportunity to share and discuss curriculum and assessment designs with colleagues. We believe that such sessions provide a powerful approach to professional development because the conversations focus on the heart of teaching and learning. What is worthy of understanding in this unit? What counts as evidence that students *really* understand and can use what is taught? What knowledge and skills must be taught to enable them to achieve and apply their understandings in meaningful ways?

In addition to the benefits of the process, the quality of the products is enhanced when teachers can refine their unit designs using feedback and guidance about the strengths of their designs and suggestions for improvement. Peer review provides an opportunity to see alternate design models—"Gee, I never thought about beginning this unit with a problem. I think I'll try that the next time I teach this unit."

The Peer Review Process

In this section, we describe a process for involving teachers in a peer review of their unit designs. The review is based on the design standards and the accompanying tests (see Module 20 for the design standards and tests).

Session 1: Review Without the Designer

1. The designer provides a brief overview of the unit to the review group and states any issues the designer wishes highlighted in the feedback session (Session 2). Then the designer leaves the review group.

2. The reviewers review and discuss the unit design criteria for the design standards and for the specific tests that follow each stage of backward design.

3. The reviewers individually read the unit and review unit materials (e.g., the template, rubrics, and handouts).

4. The reviewers silently assess the strengths of the design, then the areas needing improvement—in relation to the specific design criteria, not reviewer tastes.

5. Each reviewer completes the Individual Review Form for a Unit Design (Worksheet 21.1), summarizing the design's strengths and areas needing improvement *before* the entire review group discusses the design.

6. The review group discusses individual responses.

7. The review group completes the Group Review Form for a Unit Design (Worksheet 21.2), summarizing the group's key feedback and guidance. The reviewers rate the unit if appropriate, using the tests or the design standards.

Session 2: Review with the Designer

1. The review group establishes roles (e.g., timekeeper and facilitator) and sets a specific time frame for group feedback and guidance. The facilitator's key job is to gently but firmly ensure that the designer listens (instead of defending).

2. The designer clarifies any technical or logistical issues, only as requested, without elaborating on rationale or justifying the intent, history, and reasons for choices. The design must stand by itself as much as possible.

3. The reviewers give feedback, making clear the basis for their comments in the match (or mismatch) among targeted achievements, assessments, and design of

learning and teaching, using the design standards as a reference. Phrasing feedback about possible mismatches in question or conditional form may be appropriate; for example, "We wondered about the validity of the assessment task, in light of the specified goal" or, "If your aim is critical thinking, the assessments don't seem to demand more than recall."

4. The reviewers give guidance in each area where they perceive a gap between intent and effect or some confusion about the design's purpose or execution. Guidance should improve the designer's intent, not substitute the reviewers' tastes or goals for the unit.

5. The designer takes notes, asks clarifying questions, and thinks aloud about possible implications.

6. After the feedback and guidance session, the group and designer may want a debriefing session to discuss general design lessons and questions that the review raised. During the feedback and guidance session, general design questions, issues, and dilemmas should be noted for the debriefing discussion.

Tips for an Effective Peer Review Session

The reviewers should serve as friendly, honest consultants (critical friends) to the designer. The reviewers' job is twofold. First, they give useful feedback—Did the effect match the intent? Second, they give useful guidance—How might the gaps in intent versus effect be removed? How might the design be improved?

The designer's intent is the basis of the review. The aim is to improve the designer's idea, not replace it with the reviewers' teaching priorities, style, or favorite design activities. The key criterion for judging the review's success is that the designer feels that the design was understood by peers and improved (or validated) by the subsequent critique and discussion.

Consider the following guidelines when planning or conducting a peer review.

1. The reviewers should begin by paraphrasing or summarizing the designer's stated intentions.

2. The best feedback describes in detail how the elements of a unit did or did not meet the design criteria. Written and oral feedback should be based upon the tests or the design standards (see Module 20). For example,

- Will the assessment plan provide valid evidence of the targeted understandings?
- Are the unit questions appropriately incorporated into the design of the activities and assessments?
- Will the proposed lessons equip all, especially weaker, students for successful performance?

3. Designers typically assume that the design is more self-evident than it really is. Imagine yourself as a student:

- Would you know what to do?
- Would the flow of the unit be obvious?
- Is it clear how you will be assessed and how your performance will be judged?
- Do you see the purpose of the work?

4. The reviewers should begin the feedback session by highlighting those areas where the design most conforms to the design criteria, describing in detail how and where the design meets those criteria. For example,

- "Your task was authentic. This is clearly the kind of work that a scientist routinely does; the constraints are realistic."
- "The unit effectively honors the 'W' in WHERE. By beginning with an analysis of previous student work and developing rubrics together, your design is clear, so that students will know what is expected of them in the unit."

5. Giving feedback about problems in the design is always difficult but made easier by casting it more as a question or conditional response rather than as a firm declaration. Useful phrasing for beginning critical comments include:

- "We had a few questions about the validity of ..."
- "I had a hard time finding the link between ..."
- "We weren't sure about the target ..."

- "If your goal was to _____, then I am concerned about whether students will see . . ."

Avoid using these types of phrases:

- "It was obvious to us that . . ."
- "Your assessment didn't make sense."
- "Kids would never . . ."

6. Remember that the designer's role during the peer review discussion is primarily that of a listener and note taker. Designers should avoid explaining, defending, or justifying their unit designs.

MISCONCEPTION ALERT

The goal of peer review is to provide helpful feedback and guidance, not to make a value judgment about a colleague's work. The distinction between feedback and guidance is almost universally misunderstood. Despite common parlance, feedback merely describes what happened, not how one feels about it or what should be changed.

As a result of this misconception, a common mistake in peer review is to assume that the peer review process is meant to offer advice on what to do differently. Such advice is far less important than accurately describing the design's strengths and weaknesses—based on design standards—so that the designer will understand why advice is offered.

REFLECTION FROM BOB JAMES

This is my first experience with peer review, and I found it enormously beneficial. I received excellent feedback on my nutrition unit and a number of practical ideas for refining it. For example, one teacher suggested a performance task that will work well for one of my understandings—that the USDA food pyramid provides relative guidelines, but that dietary requirements vary

according to individual needs. The task asks students to write a letter to Mr. and Ms. Jack Spratt, explaining the potential health risks of their diets (especially Ms. Spratt's) and suggesting a more balanced diet (for one week) based on the needs of each person. Not only did I benefit from the review, but I believe I provided some helpful feedback and guidance to my fellow teachers.

After the review, several of us were commenting that our required inservice days could be more valuable if we could have more opportunities for such rich discussions with colleagues.

WORKSHEET 21.1

Individual Review Form for a Unit Design

Backward Design Process

Stage 1: Identify Desired Results
- **A** ▸ Enduring Understandings
- **B** ▸ Essential Questions
- **C** ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ▸ Performance Tasks
  - ➤ Performance Task Blueprint (D)
- **E** ▸ Quizzes, Tests, Prompts
- **F** ▸ Unprompted Evidence
- **G** ▸ Self-Assessment
  - ➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ▸ Sequence of Learning Experiences and Instruction

Reviewer: Unit Title: Date:

Strengths (in reference to the design criteria)

-
-
-
-
-

Areas needing improvement (in reference to the design criteria)

-
-
-
-
-

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WORKSHEET 21.2

GROUP REVIEW FORM FOR A UNIT DESIGN

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
A ▸ Enduring Understandings
B ▸ Essential Questions
C ▸ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
D ▸ Performance Tasks
➢ Performance Task Blueprint (D)
E ▸ Quizzes, Tests, Prompts
F ▸ Unprompted Evidence
G ▸ Self-Assessment
➢ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
H ▸ Sequence of Learning Experiences and Instruction

Reviewer: Unit Title: Date:

Feedback: comments on intent versus effect of the design and on the review criteria

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-

Guidance: advice based upon feedback; that is, what revisions would enable the design to meet the criteria?

-
-
-
-
-

-65

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GLOSSARY AND BIBLIOGRAPHY

BACKWARD DESIGN PROCESS

Stage 1: Identify Desired Results
- **A** ◗ Enduring Understandings
- **B** ◗ Essential Questions
- **C** ◗ Knowledge and Skills

Stage 2: Determine Acceptable Evidence
- **D** ◗ Performance Tasks
- ➤ Performance Task Blueprint (D)
- **E** ◗ Quizzes, Tests, Prompts
- **F** ◗ Unprompted Evidence
- **G** ◗ Self-Assessment
- ➤ Blueprint for Other Evidence (E, F, G)

Stage 3: Plan Learning Experiences and Instruction
- **H** ◗ Sequence of Learning Experiences and Instruction

GLOSSARY

academic prompt A form of assessment between an authentic performance task and a short-answer test or quiz. Academic prompts are open-ended, written performance tests. They occur only in school or exam situations. Students are prompted by a tester to respond to a particular quote, idea, or request for performance. Such prompts are not authentic because typical school constraints are placed on the situation, such as access to resources, time allotted, and limits on talking to others. *Contrast* **authentic assessment task; quiz.**

achievement target A specific educational goal. Common synonyms include goal, objective, outcome, and intended result. A target is more specific than a goal, more cognitively complex than an objective, and more exclusively focused on intellectual matters than an outcome. A target about complex intended learnings must be cast in measurable terms. An assessment is designed to measure the degree to which a target was "hit" by a learner's work. When focusing on matters of understanding, a target is best stated as a specific proposition a teacher wants students to understand; for example, Living things adapt to harsh environments to survive. *See also* **outcome.**

analytic rubric Also called analytic scoring rubric. A rubric that applies several distinct criteria to evaluate student products and performances. In effect, a performance is assessed several times, using the lens of a separate criterion each time. For example, when using an analytic rubric to evaluate essays, a teacher might evaluate five traits: organization, use of detail, attention to audience, persuasiveness, and conventions. *Contrast* **holistic rubric.** *See also* **rubric.**

anchors Samples of work or performance used to set the specific performance standard for each level of a rubric. For example, attached to a paragraph describing a six-level performance in writing would be two to three samples of writing that illustrate what a six-level performance is. The anchor for the top score is often called the exemplar.

Anchors contribute significantly to scoring reliability. A rubric without anchors is typically too ambiguous to set a clear standard for judges and performers alike. Such phrases as "sophisticated and persuasive" or "insightful mathematical solution" mean little unless teachers have examples of work that give concrete and stable definition to them. Anchors provide students with tangible models of quality work. *See also* **exemplar; rubric.**

application One of the six facets of understanding. The ability to apply knowledge and skill in new situations and diverse contexts. *See also* **empathy; explanation; interpretation; perspective; self-knowledge.**

assess To thoroughly and methodically analyze student accomplishments against specific goals and criteria.

assessments Techniques to analyze student accomplishments against specific goals and criteria. Includes paper-pencil tests, exhibits, interviews, surveys, and observations. Good assessment requires a balance of techniques because each technique is limited and prone to error.

Assessment is sometimes synonymous with evaluation, though a subtle difference exists. A teacher might assess the strengths and weaknesses of a student's performance without placing a value or a grade on that performance.

authentic assessment task A task designed to simulate or replicate important, real-world challenges, such as asking a student to use knowledge in contexts where the purposes, audiences, and situational variables are genuine. Thus, the context of the assessment—not just the task itself—is what makes the work authentic (e.g., the messiness of a problem, ability to seek feedback and revise, and access to apt resources).

An authentic task directly measures students on performances teachers value. By contrast, multiple-choice tests are indirect measures of performance. For example, compare the road test (a direct test) to the written test (an indirect test) for getting a driver's license. In the field of measurement, authentic tests are called direct tests.

Not all performance-based testing is authentic, and not all authentic tasks are valid. A standardized writing prompt or laboratory experiment is a complex performance task, but it is not "authentic." The timed nature of the task, enforced silence, test security, and absence of resources make the task inauthentic, even though the test result might be valid. If a written test for a driver's license correlates with driving records and accident rates, the test is valid, even though it is an inauthentic test of driving performance. The reverse is true also. A task can be

authentic but not properly designed to allow for valid inferences about the targeted understanding. For example, asking a new driver to drive around the block is authentic but not sufficiently challenging or varied to permit valid inferences about driving ability. (See Wiggins [1998] for a more thorough account of authenticity and validity in the design of student assessment.)

backward design A process to designing a curriculum or unit by beginning with the end in mind and designing toward that end. Why is such a view backward when it seems logical? Many teachers *begin* their unit design with textbooks, favored lessons, and time-honored activities rather than deriving it from targeted goals or standards. In backward design, one starts with the end—the desired results—and then identifies the evidence necessary to determine that the results have been achieved—the assessments. With the results and assessments clearly specified, one can determine the necessary (enabling) knowledge and skill, and then the teaching needed to equip students to perform.

benchmark (1) A developmentally appropriate content or performance standard. For example, many districtwide systems have set benchmarks for grades 4, 8, 10, and 12. Also called a milepost standard. (2) The best possible samples of work to anchor an assessment. This usage comes from industry, where benchmark is often used as a verb and a noun. As a verb, benchmark means to search for a best performance or achievement specification for a particular objective anywhere in the world. The resulting benchmark (noun) sets the highest possible performance standard, a goal to be met or exceeded locally.

big ideas The core concepts, principles, theories, and processes that should serve as the focal point of curriculums, instruction, and assessment. Big ideas are important, enduring, and transferable beyond the scope of a particular unit. An example of a big idea is, Thriving organisms adapt to harsh environments.

concept A mental construct represented by a word. Concepts include both tangible objects (e.g., a chair or rabbit) and abstract ideas (e.g., democracy and bravery).

content standard A goal statement that identifies the knowledge and skills to be learned in the content areas. A content standard specifies *what* we want students to know and be able to do. *See also* **performance standard**.

coverage A teaching approach that superficially teaches and tests content knowledge, irrespective of student understanding or engagement. The phrase generally has a negative connotation. It implies that the goal is to march through a body of material (often a textbook) within a specified time frame. *Contrast* **uncoverage**.

criteria The qualities that must be met for work to measure up to a standard. To ask, What are the criteria? means to ask, What should teachers look for when

examining student products or performances to know if they were successful? How will teachers determine acceptable work?

Criteria should be considered prior to designing specific performance tasks, though this order may seem odd to novice teachers. For example, if teachers want to design a task that measures critical thinking, they need to know beforehand what the indicators of such thinking are, and then design the task to require such traits to be demonstrated through performance.

An assessment must determine how much weight each criterion should receive relative to other criteria. For example, if teachers agree that spelling, organization, and the development of ideas are all important in judging writing, are they of equal importance? If not, what percentage should be assigned to each?

The criteria used in judging performance, like a test itself, can be valid or invalid, and authentic or inauthentic. For example, one can assign students to do original historical research (an authentic task), but grade the work only on whether four sources were used and whether the report is exactly five pages long. Such criteria would be invalid because one can easily imagine a piece of historical work that does not meet those two criteria but is still excellent research. Criteria should correspond to the qualities of masterful performance.

Five different types of criteria are at play in any complex performance: impact, methods, work products/performances, content validity, and degree of sophistication. The analysis is useful when one observes how often performance assessments undervalue impact criteria and overvalue (look only for) content validity and craftsmanship in methods used. (See Chapters 5 and 6 in Wiggins [1998] for more on these types of criteria.)

curriculum The explicit and comprehensive plan developed to honor a framework of standards. A curriculum is thus a course or program of study composed of numerous units.

design As a verb, means to "plan the form and structure" of something; as a noun, the "pattern or motif" of a work of art. In education, teachers are designers in both senses, aiming to develop purposeful, coherent, effective, and engaging lessons, units, and courses of study and accompanying assessments to achieve identified results.

Something that happens by design occurs through thoughtful planning as opposed to by accident or by winging it. At the heart of Understanding by Design is the idea that the planning a teacher does before teaching is as important as the teaching itself.

design standards The specific standards that evaluate the quality of unit designs. Design standards have a dual purpose: to guide self-assessment and peer reviews to identify design strengths and needed improvements; and to provide a mechanism for quality control as a means of validating curricular designs.

empathy One of the six facets of understanding. The ability to walk in another's shoes; to escape one's own beliefs and emotional reactions to grasp another's. *See also* **application; explanation; interpretation; perspective; self-knowledge.**

enduring understandings The important ideas or core processes that have lasting value beyond the classroom. Such understandings are generally abstract in nature, so they require uncoverage through sustained inquiry. To determine enduring understandings for a unit or course, teachers are encouraged to ask, What do we want students to understand and be able to use several years from now, after they have forgotten the details? *See also* **uncoverage.**

entry question A simple, thought-provoking question that opens a lesson or unit. It often introduces a key idea or understanding in an accessible way. *See also* **essential question.**

essential question A provocative question designed to engage student interest and guide inquiry into the important ideas in a field of study. Rather than yielding pat answers, essential questions are intended to stimulate discussion and rethinking over time. There are two types of essential questions: overarching and topical. *See also* **entry question; overarching question; topical question**

exemplar The anchor for the top score in a rubric. *See also* **anchors; rubric.**

explanation One of the six facets of understanding. Sophisticated and apt explanations and theories, which provide knowledgeable and justified accounts of events, actions, and ideas. *See also* **application; empathy; interpretation; perspective; self-knowledge.**

facets of understanding The six different kinds of understanding identified in Understanding by Design: explanation, interpretation, application, perspective, empathy, and self-knowledge. Understanding (or lack of it) reveals itself in different, mutually reinforcing ways. In other words, the more a student is able to explain, apply, or offer multiple points of view on the same idea, the more likely it is that the student understands that idea. *See also* **application; empathy; explanation; interpretation; perspective; self-knowledge.**

generalization A general rule that describes a relationship among concepts. The Understanding by Design approach suggests that targeted understandings be framed as generalizations or propositions, not just phrases that refer to a topic or content standard. *See also* **proposition.**

holistic rubric A rubric used to obtain an overall impression of the quality of a performance or product. Typically, a holistic evaluation yields a single score. *Contrast* **analytic rubric.** *See also* **rubric.**

ill-structured A term used to describe a question, problem, or task that has no recipe or obvious formula to answer or solve it. Often the problem is fuzzy and needs to be further defined or clarified before a solution can be offered. Such questions or problems thus demand more than knowledge—they demand good judgment and imagination.

Most problems in life are ill-structured; most test items are not because they have a single, unambiguous right answer.

intelligent tool A tool that puts abstract ideas and processes in a tangible form. An intelligent tool enhances performance on cognitive tasks, such as the design of learning units. For example, an effective graphic organizer like a story map helps students internalize the elements of a story in ways that enhance their reading and writing of stories. Likewise, routinely using intelligent tools like the unit planning template and the Understanding by Design tools should help users develop a mental template of the key ideas of Understanding by Design.

interpretation One of the six facets of understanding. Interpretations, narratives, and translations that provide meaning. *See also* **application; empathy; explanation; perspective; self-knowledge.**

iterative approach A process that continually revisits earlier work. Synonyms include recursive, circular, and spiral-like. An iterative approach is the opposite of a linear or step-by-step process. The curricular design process is always iterative. Teachers keep revisiting their initial ideas about what they are after, how to assess it, and how they should teach to it as they keep working on each element of their design.

open-ended A phrase used to describe tasks and questions that do not lead to a single right answer. Rather, many different acceptable answers are possible. Such answers are justified, plausible, or well-defended as opposed to correct. Essay test questions, for example, are open-ended, whereas multiple-choice tests are not (by design).

outcome Shorthand for intended outcome of instruction. A desired result or a specific goal to which an educator can commit. In Understanding by Design, achievement target describes such intents, although goal is sometimes used for the sake of variety. *See also* **achievement target.**

overarching question A provocative essential question that transcends the particular topic of a unit, pointing toward larger, transferable ideas.

perform To act upon and bring to completion. *See also* **performance task.**

performance *See* **performance task.**

performance standard An established level of achievement, quality of performance, or degree of proficiency. A performance standard specifies how well students are expected to achieve or perform. See also **content standard**.

performance task Also called performance. A task that uses one's knowledge to effectively act or bring to fruition a complex product in which one's knowledge and expertise are revealed. Music recitals, oral presentations, art displays, and auto mechanic competitions are performance tasks.

Many educators mistakenly use performance assessment to mean performance test (see **assessments**). A performance assessment uses more than a single test of performance and may use other modes of assessment as well (such as surveys, interviews of the performer, observations, and quizzes).

Tests of performance, whether or not authentic, are different from multiple-choice or short-answer tests. In a test of performance, a student must put everything together in the context of ill-structured, nonroutine, or unpredictable problems or challenges. By contrast, most conventional short-answer or multiple-choice tests are more like the drills in sports than tests of performance. Real performers—whether they are athletes, debaters, dancers, scientists, or actors—must learn to innovate and use their judgment as well as their knowledge. Multiple-choice test items merely ask a student to recall, recognize, or plug in isolated, discrete knowledge or skill, one at a time. Because many types of performances are ephemeral actions, a fair and technically sound assessment typically requires the creation of a product. Such a requirement creates adequate documentation and the possibility of appropriate review and oversight in scoring the performance.

perspective One of the six facets of understanding. Critical and insightful points of view. When one understands, one can get at a distance from what is known and avoid getting caught up in the views and passions of the moment. See also **application**; **empathy**; **explanation**; **interpretation**; **self-knowledge**.

portfolio A representative collection of one's work. The work is fashioned for a particular objective and carried from place to place for inspection or exhibition. In academic subject areas, a portfolio often has two purposes: to provide documentation of a student's work, and to serve as the basis for evaluation of work in progress or work over time. The documentation typically serves these functions: to reveal a student's control over all the major areas, techniques, genres, and topics of a course or program; to allow a student to reflect on and show off best work (by letting the student select which works will go in the portfolio); and to provide evidence of how works evolved and were refined.

prerequisite knowledge and skill The knowledge and skill required to accomplish the goals of a unit in a culminating and complex performance task. Typically, prerequisites identify the more discrete knowledge and know-how required to put everything together in a meaningful final performance. For example, knowledge of the USDA food pyramid guidelines would be considered a prerequisite to the task of planning a healthy and balanced diet for a week.

process In the context of assessment, refers to the intermediate steps students take in reaching a final performance or end-product specified by an assessment. Process includes all strategies, decisions, subskills, rough drafts, and rehearsals used in completing a given task.

When evaluating the process leading to a final performance or product, an assessor is sometimes asked to explicitly judge a student's intermediate steps, independent of what can be inferred about those processes from the end result. For example, an assessor might rate a student's ability to work within a group or prepare an outline as a prewriting component of a research project—independent of the ultimate product the group or individual writer produces. Educators should be cautious, however, of evaluating process skills separately. The emphasis should be on whether the final product or performance met the standards set, irrespective of how the student got there. *See also* **backward design**.

product A tangible result of a performance and the processes that led to it. A product is valid for assessing a student's knowledge to produce it to the extent that the product reflects the knowledge taught and is an appropriate sample from the whole curriculum of the relative importance of the material.

project A complex set of intellectual challenges, typically occurring over lengthy periods of time. Projects usually involve extensive student inquiry culminating in student products and performances. A unit might be composed of a single project but include multiple tasks and other forms of assessment evidence, such as quizzes, tests, and observations, along the way.

prompt *See* **academic prompt**.

proposition A statement that describes a relationship among concepts. The Understanding by Design approach suggests that targeted understandings be framed as specific generalizations or propositions to be understood, not just phrases that refer to a topic or content standard. Propositions include principles, generalizations, axioms, and laws. *See also* **generalization**.

question *See* **entry question**; **essential question**; **overarching question**; **topical question**.

quiz A selected-response or short-answer test (oral or written) whose sole purpose is to assess for discrete knowledge and skill. *Contrast* **academic prompt**.

reliability In measurement and testing, refers to the accuracy of a score. Is it sufficiently free of error? What is the likelihood that the score or grade would be constant if the test were retaken or the same performance were rescored by someone else? Error is unavoidable; all tests, including the best multiple-choice tests, lack 100 percent reliability. The aim is to minimize error to tolerable levels.

In performance assessment, the reliability problem typically occurs in two forms: (1) To what extent can one generalize from the single or small amount of performances to a student's likely performance in general? or, Is the score truly representative of the student's general capacities and patterns of results? and (2) What is the likelihood that different judges will see the same performance in the same way? The second question involves what is typically termed interrater reliability.

rubric A criterion-based scoring guide that enables assessors to make reliable judgments about student work and enables students to self-assess. A rubric answers the question, What does understanding or proficiency for an identified achievement target look like?

A typical rubric is based on a continuum of performance quality, built upon a scale of different possible score points to be assigned. Scores often range from 6 as the top score, down to 1 or 0 for the lowest score. A rubric identifies the key traits or dimensions to be examined and assessed (e.g., "syntax" or "understanding of the scientific method"). It provides key features of performance for each level of scoring, using descriptors that signify the degree to which the criteria have been met, thus enabling a judge to assign an appropriate score. *See also* **analytic rubric**; **holistic rubric**.

sampling All unit and test design involves the act of sampling from a vast domain of possible knowledge, skills, and tasks. Like the Gallup polls, sampling enables an assessor to draw valid inferences from a limited inquiry if the sample of work or answers is appropriate and justified.

Unit and test design use two different kinds of sampling: sampling that involves the wider domain of all possible curricular questions, topics, and tasks, and sampling that assesses only a sample (or subset) of an entire student population instead of testing everyone. These two kinds of sampling are combined in large-scale testing systems to form matrix sampling, whereby one can test many or all students using different tests to cover as much of the domain of knowledge as possible.

When teachers attempt to sample the domain of subject matter in a unit through a specific task, they must ask, What feasible and efficient sample of tasks or questions will enable us to make valid inferences about a student's overall performance (because we cannot possibly test the student on everything that was taught and learned)?

scoring guide *See* **rubric**.

secure test A test in which one does not have prior access to the test questions to prepare for the test. Most multiple-choice tests must be secure or their validity is compromised because they rely on a small number of uncomplicated questions. Many valid performance assessments are not secure (e.g., a road test for getting a driver's license).

self-knowledge One of the six facets of understanding. The accuracy of self-assessment and awareness of the biases in one's understanding brought about by favored styles of inquiry, habitual ways of thinking, and unexamined beliefs. Accuracy of self-assessment means that one clearly understands what one does not understand. *See also* **application; empathy; explanation; interpretation; perspective.**

standardized A term used to describe the administrative conditions and protocol that are uniform for all students. In other words, if all students face similar guidelines for logistics, time, material, and feedback, plus constraints to take a test, then the test is standardized.

standards *See* **content standard; design standards; performance standard.**

target *See* **achievement target.**

task *See* **performance task.**

Taxonomy of Educational Objectives: Classification of Educational Goals. Handbook 1: Cognitive Domain. A book written by Bloom (1956) and his colleagues to classify the range of possible intellectual objectives, from the cognitively easy to the difficult—in other words, to classify degrees of understanding. They identified six cognitive levels: knowledge, comprehension, application, analysis, synthesis, and evaluation, with the last three commonly referred to as "higher order." The authors used application in a narrower sense than educators use it today. In the taxonomy, application means applying discrete knowledge or skill in an exam setting, such as constructing a sentence or solving a math word problem. Today's usage refers to a more sophisticated act of drawing it on a repertoire to solve a complex, multifaceted contextualized problem. The taxonomy authors' description of synthesis better fits the meaning of application used in Understanding by Design in particular and the performance assessment movement in general.

template. A guide or framework for designers. In its original usage, a template was a thin form—constructed of paper, wood, or sheet metal—whose edge provided a guide for cutting a particular shape. In Understanding by Design, the unit planning template provides a conceptual guide to apply the elements of backward design in developing or refining a unit of study. Each page of the template contains key questions and graphic organizers for recording design ideas.

tool *See* **intelligent tool.**

topical question An engaging and focusing essential question that frames a particular unit of study. It is a more narrowly focused and content-specific form of

an essential question than an overarching question. *See also* **entry question**; **essential question**; **overarching question**.

transferability The ability to use knowledge appropriately and fruitfully in a new or different context from that in which it was initially learned. For example, a student who understands the concept of "balanced diet" (based on the USDA food pyramid guidelines) applies that understanding when evaluating hypothetical diets for their nutritional values and by creating nutritional menus that meet the food pyramid recommendations.

uncoverage A teaching approach that is required for all matters of understanding. To uncover a subject is to do the opposite of covering it, namely, to go into depth. Three types of content typically demand such uncoverage. The content may be *principles, laws, theories, or concepts* that are likely to have meaning for a student only if they are seen as sensible and plausible; that is, the student can verify, induce, or justify the content through inquiry and construction. The content may be *counterintuitive, nuanced, subtle, or otherwise easily misunderstood ideas*, such as gravity, evolution, imaginary numbers, irony, texts, formulas, theories, or concepts. The content may be the *conceptual or strategic element of any skill* (e.g., persuasion in writing or "creating space" in soccer). Such uncoverage involves clarifying effective and efficient means, given the ends of skill, leading to greater purposefulness and less mindless use of techniques.

unit Short for unit of study. Though no hard and fast criteria exist for what makes up a unit, educators generally think of a unit as a body of subject matter that is somewhere in length between a lesson and an entire course of study; that focuses on a major topic (e.g., the Revolutionary War) or process (e.g., the research process); and that lasts from a few days to a few weeks.

validity The inferences one can confidently draw about student learning based on the results of an assessment. Does the test measure what it purports to measure? Do the test results correlate with other performance results educators consider valid? Does the sample of questions or tasks accurately correlate with what students would do if tested on everything that was taught? Do the results have predictive value; that is, do they correlate with likely future success in the subject in question? Some or all of these questions must have a yes answer for a test to have validity.

WHERE Acronym for, **W**here the work is headed; **H**ook students through engaging and provocative entry points; **E**xplore the subject in depth and equip students with required knowledge and skill to perform successfully on final tasks; **R**ethink with students the ideas and answers as students rehearse and revise; and **E**valuate results and develop action plans through self-assessment of results.

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The UNDERSTANDING *by* DESIGN *Handbook*

What is *understanding*, and how does it differ from *knowing*? How will we know that students truly understand and can apply their knowledge in meaningful ways? How might we design our courses and units to emphasize understanding and "uncoverage" rather than "coverage"? These are questions that *The Understanding by Design Handbook* guides users in answering.

The handbook is the companion book to *Understanding by Design* (ASCD, 1998). *Understanding by Design* provides the conceptual foundation for a theory of understanding that is based on six facets of understanding. The handbook offers the practical side: a unit planning template, worksheets, exercises, design tools, design standards and tests, and a peer review process for learning and applying the ideas in *Understanding by Design*. Following the logic of the authors' backward design approach, handbook materials show users how to plan curriculum, assessment, and instruction.

The handbook was developed to assist educators interested in designing units and courses of study that focus on developing and deepening students' understanding. It is also intended to serve as a resource for undergraduate and graduate-level coursework and in-service professional development. Various users, including teachers (elementary through graduate levels), school-based administrators, curriculum directors, subject matter specialists, staff developers, and assessment-evaluation personnel, will benefit from these practical and proven ideas and resources.

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ISBN 0-87120-340-5

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